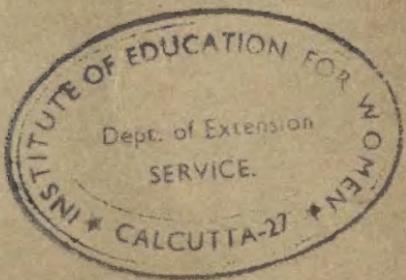


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Man in the Beginning



Man in the Beginning

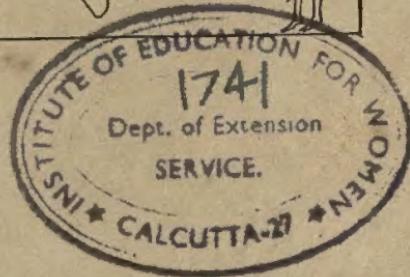
The Story of our own Origins

by

William Howells



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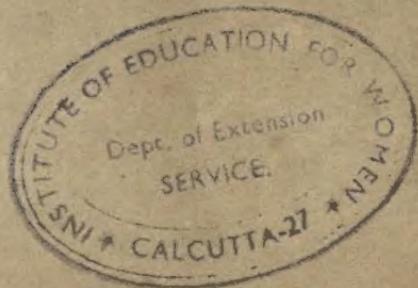
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TO MY PARENTS
with love and thanks



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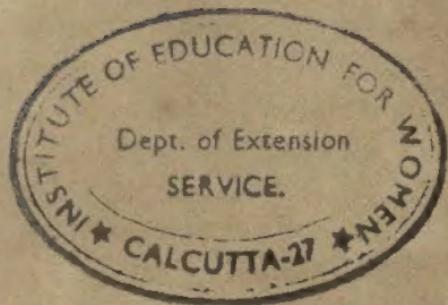
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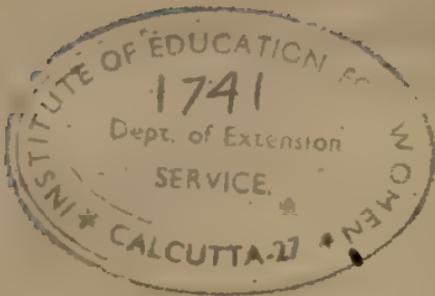
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Man in the Beginning



Prologue



It's a wise child that knows its own father. And it is a wise father that has more than the faintest idea where we all began, and why we behave as we do. Here we are, frightened in a complicated world of machinery and war, each of us depending on all the rest of us. Somehow we came to be human. And somehow we came to be civilized. But how? We think of ourselves as the creatures the earth was made for—something quite apart from other animals. And then we take a closer look, and are amazed to find ourselves so like the animals, in our bodies and our needs, that we almost pinch ourselves to be sure we are human after all.

History tells us little enough: king reigned before king and then, five or six thousand years ago, no more kings are remembered, and no word comes straight down to us to say how men arranged their affairs in the remoter past. But we may look about or dig for other kinds of information about our whole complicated, untidy existence of today, and perceive something of the outlines of its beginnings, its development and its relations to our own animal nature. For the story of man is a nature story.

This is not an easy thing to understand, and never has been. Many primitive people have some story about a Maker, who simply baked up the first man like a cake, and then showed him what to do. And even our own philosophers have usually tried to explain man's relation to nature in man's own terms, not nature's. We think of Mother Nature without too great respect. She is somebody else's mother, not ours.

Now of course having a life strikingly different from the rest of nature is the essence of being human. That is the obvious part.

What is not so obvious is that this difference arose within nature, by natural processes and events; and that humanity, difference and all, is just as much a part of nature as ever it was. We wear clothes, and in other ways, too, we separate ourselves from nature; but we easily fool ourselves, and forget how much clothes make the man. We are apt to let our differences from nature hide our very great connections with nature.

The dilemma is not surprising. A native child growing up in the Australian bush may feel more of the strength of his kinship with nature, and sense more keenly his lack of arts to control it; furthermore the tribal beliefs he will be taught as a young man will tell him that he, the animals, the sky and the wind are all cousins. But one of our own children goes hopefully forth to school and is soon overwhelmed, and usually repelled once and for all, by the sight of so much to learn about what man can do and has already done. We have now made ourselves such a world, and are so completely governed by it, that we do not even know it. It is likely that, if your goldfish could think, he would take it for granted that you were in a bowl and he was outside in the water, peering in at you. Actually, we ourselves are a good deal like that goldfish.

Look at a medieval cathedral like Chartres, as Henry Adams did, or at a modern newspaper, and all that lies back of either of them. Things like this measure humanity, the difference between the human species and everything else in nature. How can such a life as ours possibly be a logical, integral part of nature itself? It is a paradox of such staggering proportions that there is little wonder if tribes and nations have simply screened it off with myth. But man and his life consist of paradox, and paradox within paradox. He is the hairy animal without hair, the four-legged animal with only two legs, the dumb animal that talks, the creature who comprehends things he cannot see and believes in things he cannot comprehend. He can only be explained by a lot of oddities, but at the end of all this he can only be understood if the oddities themselves are understood as perfectly natural oddities.

We usually think of history as history, and of biology as biology. Our familiar, written history begins with people already living in cities, an easily imagined life. On the other hand, animal history, or evolution, deals with fossils, and with horses and elephants, fishes and protozoa. But if you are going to study the full history of man, you must be aware that there is no real line here. You begin in a biological world, when man's existence was that of an animal. Then, as man appears, you must shift interest gradually from man himself to what he is doing, since he is beginning to do things no other animal can do. Your clock, which was first ticking in millions of years, then thousands, then hundreds, has slowed down, and man himself changes less and less, until you are considering men all like ourselves, who differ simply in the life they lead. You are now in the preface of history proper.

Remember that this shift of interest is only a transition, for there is a long time when what man does is very much a question of what he is. Slowly he became able to treat "ideas" in a new way until his ideas in turn became, as they are today, the major part of the world surrounding him. We cannot properly separate the story of his ideas from the story of man himself, any more than we can separate the heartbeat from the heart.

1 *The coming of mankind*

Before we could be human we had to be animal, just as each of us must be before he is born and when he is very young. Mankind became able to talk and plan and be mechanical only because a billion years or so of evolution had laid the groundwork. This evolution allowed simple living things to become complex, and later allowed the lower vertebrate animals to provide various structures—eyes, brains, skeleton—which, in higher animals, were capable of being finally developed to the degree which human life demands. We could not call ourselves human, or behave human, if our brains were not quite so large as they are and our hands not quite so useful, and our legs not quite so efficient in holding us upright while we do our work. Yet we would not be here at all if there had not been animals of just this almost-human sort, from whom we could arise. And indeed we can see something like them in various ways, in our cousins the anthropoid apes.

Most of this history we need not inspect at all; certainly not a billion years' worth. The story begins, for practical purposes, about seventy or seventy-five million years ago. This rough date marks the opening of the Cenozoic Era (Tertiary Period) of geological time, or the Age of Mammals. Now of course the human ancestor had already covered important ground, though it is ground we shall take for granted. In his very ancient first stage, as a fish, he had been endowed with his basic form: his backbone and skull, his central brain pattern, his system for the circulation of blood, and even the rudiments of limbs and lungs. Following a shift from sea to land, much-improved "fish" ap-

peared in the ancient amphibians and reptiles. Some of the latter, in fact, carried the possibilities of progress in the design of the skeleton, and such functions as egg-protection, to the point where they moved up into a second great stage, that of the mammals.

These new animals bore their young alive, cared for them after birth, and fed them milk; furthermore, they were warm-blooded, with warming fur and cooling sweat glands. They were, in a word, creatures who could grow slowly to a complicated mature form, receiving the utmost in parental nourishment and protection in the most crucial stages, arriving finally at a body organization without a peer in activity, stamina, excellence of senses and nervous and muscular response. And they were able to combine all these things with large size.

Large size, however, was the monopoly of the dinosaurs when the mammals first arose. The latter were still small and simple when the dinosaurs left the scene and Cenozoic time began. Their promise as a type of animal became fulfilled during this period, as they took many forms, which tended severally to become larger in size, to develop larger brains, and to vary themselves in the most astonishing way to fit themselves to the diets and regions offered to them by the continents, and even the sea and the air. This mammal family tree, as we know it from its fossil remains, is something to return to again and again when we study how evolution takes place. Let us look for a moment at a few of the principles of evolution which will have a bearing on our main story.

Evolution at work

Evolution is no simple process, but we may say with Darwin that the ruling agent, without which the whole makes no sense, is natural selection. This in itself is not a single, simple thing. Instead, it is the result of the most advantageous fitting together of everything in the environment of an animal breed with everything in the physical nature of the animals themselves. Out

of the entire breed, those most favored by their individual heredity in this fitting will be most successful in surviving and reproducing (and so passing on their inherited features), and their progeny should become more numerous relative to that of their brothers and sisters. Thus the breed as a whole tends to become, or remain, "fitter." ("Survival of the fittest.") In all this, the interplay between animals and their environment may be far too intricate for us to analyze fully, but of course the effective environment is very much a result of what the animal brings to it. As a crude example, a stream may be a way of life, but quite a different one, to a fish and an otter; while it may be only a barrier, but a small or large one, to a buffalo or a field mouse. Thus accidental new or modified features (arising as mutations) in members of an animal breed, or changes in the environment itself, may affect the total combination and allow natural selection to pull the breed away from its existing form. So does a breed evolve, and so may two breeds, once identical, separate, follow different paths, and become finally quite unlike.

Such gradual changing and constant adjustment will give a picture of slow evolution, seemingly smooth but actually made up of a great many tiny interlocking steps, which may go a long distance in one general direction in pursuit of a constant advantage. Otters, seals and dolphins have all given themselves over to swimming, to different degrees. Along with this dignified progress, however, there may occur much more rapid motion at certain junctures, bringing more radical changes.

Suppose some hitherto neutral, unimportant feature, which the animal type happens to have, or has been using in one particular way, accidentally develops to a critical point, or otherwise comes to match some brand-new use (perhaps the environment changes). Such an event may open up new territory, which the species could not penetrate before. So on a grand scale the birds, who may have had feathers to help them keep warm¹ before ever

¹Birds are not mammals but arose somewhat later from the reptiles, and, like the mammals, also developed warm blood.

they could fly but who, on using them for flight, found the domain of the air wide open and became a major form of vertebrate life. So, for a better example, some of the ancient horses, whose teeth at one stage became high enough and complex enough in the crowns to chew up the grass of the plains as well as the softer undergrowth of the woods, whereat they came out into the grasslands and spread over nearly the whole world, in great numbers.

Such rapid strides may look deceptively like long jumps, without intervening steps. But it is actually more like the trip from first base to second, on which one does not tarry unless one wants to be tagged out. The fully adapted new form, and the older form from which it sprang, are each better fitted than the ones between, which are off base. It is not, of course, as though the breed concerned knew which evolutionary goal was calling it, and sprinted in that direction. Rather, it is figuratively as though some of the animals, doing well enough on an island home, accidentally wandered down onto a tidal beach and found that it led them to a new uninhabited islet on which this colony could flourish anew. Their stay on the beach would have been short, and the beach itself would be likely to wash out, carrying any laggards with it.

Thus it is that, in the history of evolution, the important transitions sometimes took place rapidly, and left so few of the transitional fossils that such forms may never be known. The early birds did *not* get all the worms; the first birds were rare birds, and we are extremely lucky to have found a few traces of them. They were, so to speak, experimental models. You might compare the total of all the planes ever made by the Wright brothers with the total of all the planes ever made by Boeing, Douglas and Martin. Once across the beach, however, the new territory has generally encouraged the migrants to be fruitful and multiply like the Mayflower descendants, diversifying to meet various possibilities offered. All kinds of new models of the type will arise, until competition establishes a few of them as the most successful, and many of the others become extinct. These phenomena—the occasional rapid transitions, the washouts of the

transitional forms, the burgeoning of types among the successful crossers, and their final narrowing down—all have their applications to the ancestry of man.

Primates' progress

Going back to the main story to look for the human forerunner, we shall find him somewhere in the ancient Primates, whose nearest modern descendants are the lemurs and the strange little bug-eyed, skinny-fingered tarsiers of the Philippines and Borneo. At the beginning of the Tertiary the mammals were already busy splitting up into different major lines. They were all, however, on the whole still small and primitive, and thus more alike than the mammals are today; they would be best represented in living animals by the unpretentious insectivores—shrews, moles and the like. From them arose the Primates, not by radical changes or progress but rather by retention and moderate improvement of some ancient traits which, in particular, gave them fairly efficient grasping paws. These traits were nails where most mammals had claws, five well-separated fingers or toes, an ability to rotate the thumb and great toe so as to oppose the other digits, and a good movable arm helped by a good development of the collarbone and the two bones of the forearm.

Otherwise the Primates were quite unprodigal. Generalized as they were, they were well suited to make use of all aspects of forest life and its natural foods, and the Primates ran riot, in North America and Europe especially, during the Paleocene, the first of the five divisions of the Tertiary. A great many fossil forms have been preserved, both of lemurs and of tarsiers. These halcyon days came to an end, however, about the close of the Eocene, the next division. The lower Primates vanished from America, and survived elsewhere only in spotty fashion, in Africa and southern Asia; they had one more, very late evolutionary outburst, but it was in the seclusion of the island of Madagascar, and had no effect on the faunas of the continents. Shrinking tropical climate

probably had much to do with their extinction, but also it is likely that they met serious competition in their way of life from animals whose origin was later than their own. Some of these may have had more specialized capabilities, like rodents. Some of them may have been simply improved versions of themselves, their own descendants, the higher Primates, the monkeylike creatures who make up all the rest of this order of mammals.

A monkey is a better man than a lemur, in every way. He is typically bigger, if that is any reflection of success, although there have been big lemurs. Monkeys have, in general, highly mobile and skillful hands. Their eyes face to the front, and are unsurpassed for all-around usefulness: most mammals pride themselves on their senses of smell, but the higher Primates have taken the primate preference for eyes and evolved both stereoscopic (distance-judging) vision and the greatest sensitivity to colors. High intelligence is evident in many monkey types, and all are perceptive, active animals, well suited for their principal habitat—trees—which furnishes them with flowers, buds, leaves, fruits, seeds and insects. Without having developed any specialized oddities of form (if you will overlook the indecorous behinds of some species), the monkeys represent a high level of organization in the brain- and hand-using kind of existence which is the particular property of the Primate order. It is not hard to suppose that they soon prospered in the tropical forests, which they finally took away from the lemurs and tarsiers.

How did they appear? Unfortunately there is a pretty bad washout here—there are few early fossils of higher Primates, and these are not transitional in type, but already belong to higher forms. However, three strains seem to have developed in different places toward the end of the Eocene or somewhat later.

One lot, which appeared in South America, became the New World monkeys—marmosets, spider monkeys, howling monkeys, cebus or organ-grinder monkeys, and many others. All the monkeys who can swing by their tails belong in the group.

Another lot, which seems to have no connection with the American monkeys, developed in the Old World, and gave rise to all

the monkeys of Africa and Asia. The whole fossil picture, bad though it is, indicates that the two lines have always been isolated from one another. And they differ anatomically: both are "higher Primates" in organization but are distinct in many details. For example, the New World monkeys retain three premolar (our "bicuspid") teeth, out of the ancestral four, on either side of their jaws, while the Old World monkeys have lost still another, and have only two. These monkeys, typically large, are greatly varied in type and highly successful as a group. Some live partly or wholly on the ground, notably the baboons.

• •

The upright hominoids

Enough of these monkeys: it is the third line of higher Primates which is of real concern to us. These are called the "hominoids" ("humanlike" but not to be confused with "anthropoid"), but for general purposes they can as readily be referred to as "apes." The history of the group is not as well known as we could wish. Nevertheless there are more and better fossils than in the case of the monkeys—enough at least to show it was once much larger, and has shrunk today to a mere corporal's guard: gibbons, orangutans, chimpanzees, gorillas and men. Certainly the group came into being in the Old World, but whether it first arose as part of the same stem as the Old World monkeys is simply unknown. Most authorities now think not, and consider it an independent development. Perhaps because the two lines came from a more similar parent stock of lower Primates, the hominoids are more like the monkeys of the Old World than of the New in a great many ways, even to having reduced the number of premolar teeth to two; and apparently the apes and the Old World monkeys were still more similar in the past.

One fact is outstanding: whereas the monkeys of both hemispheres remained quadrupeds, going through the trees on all fours, the apes or hominoids went off on a different tack, a tendency to maintain themselves in a more upright position. At any rate, the

existing species all show common features of the upper body strongly reflecting this tendency: heads carried partially or fully erect, broad shoulders placed well to the side of the trunk, flat chests with long collarbones and broad breastbones, and vertically suspended internal organs.

They do not all follow the same habits, but have specialized their generally upright attitude into three more or less distinct methods of getting about. One is used by the gibbons, who swing overhand from limb to limb with rapidity, ease and elegance, at something like the tempo of a Viennese waltz; this progression might be called arm-jumping, with some of their leaps covering considerable spaces between handholds. Gibbons are small animals—large ones could not safely be so aerobatic—slender and lithe, with greatly elongated arms and fingers and narrow hands; altogether they have become markedly adapted to their particular style of locomotion.

The great apes are the other three species: the orang of Borneo and Sumatra, and the chimpanzee and gorilla of equatorial Africa. The chimp is smaller than man, the orang has about the same bulk as a man, and the gorilla far more. All of these, and particularly the orang, brachiate, or swing about by the arms, and do it very well and actively. But in this case it is not a succession of jumps, like the gibbon's. It is more deliberate, and their progress includes a lot of other gymnastic clambering around in the trees; the gorilla and chimpanzee, furthermore, spend much of their time on the ground as well. The arms of these apes are relatively long and strong—in a well-grown orang they can be absolutely massive—and in general their tree-clambering life has made its mark upon their bodily designs.

Man, finally, has naught to do with trees. He uses the third method of changing his scenery: he walks about on the ground on his excessively long and strong two legs. He shares the same basic adaptation to uprightness as the tree apes, however, and in fact the hominoids are all basically much alike. All, except of course the gibbon, are now of large size, long-lived, large-brained and, compared to the rest of the animals, extremely intelligent.

It was not ever thus. The hominoids as a group must have started as small animals, from their undetermined lower Primate ancestors, probably in the Eocene—one small fragment of a fossil jaw of this date seems to be that of a tiny, primitive ape (*Amphipithecus*), who still had three premolars. Just where the tendency to uprightness comes from must for the present be a mystery. It may be extremely ancient, deriving from the parental form; or it may be that the early apes were less slavishly arboreal than the monkeys, and shifted more readily between trees and the ground.

At any rate, one branch of apes, the gibbons, early took off on their acrobatic career, and the jaw of what was most likely a small and simplified gibbon is known from the Oligocene, about halfway along in the Cenozoic. It is not until the early Miocene, at perhaps the two-thirds mark, that apes of respectable size are known, and the most interesting of these, *Proconsul*, still has some surprisingly conservative traits. By this time the apes were a flourishing family throughout the Old World, and in slightly later deposits numerous teeth and jaws have been found which proclaim the presence of various species like the forest-living great apes of today, with their heavy canine teeth and their rather sharp-cusped molar teeth, all suited for the coarse fruits and vegetable stalks of the jungle. (The principal fossil type is named *Dryopithecus*.)

This gives us, in unsatisfactory outline, the background of the apes you can see in the zoo. It does not, however, give us the background of man, for it does not seem likely (as it once did) that one of these large brachiators simply left the trees, began to stand upright, devaluated his canine teeth and became a sort of human being. On the contrary, it is probable that there was an ancient fork on the main hominoid path, leading to tree life on the one hand and to ground life on the other. We have seen how the gibbons must have split off early, becoming more and more suited to their particular style of arm-swinging, in contrast to the more general kind of ape, which kept to more deliberate, less special methods of tree travel and attained much larger size. Similarly, it appears that a third stem diverged, on the side opposite from the gibbons, consisting of apes, still small, who be-

came true ground-livers, suited not to the forests or the broken woods, but to parkland and more open country.

The man-apes of South Africa

They became, in fact, upright walkers like ourselves. They must already have had the basic hominoid form of the upper body, adapted for uprightness, but they underwent some radical changes from the waist down, for what was fundamentally a new set of habits. The spine acquired the "lumbar curve," a backward twist just above the pelvis to hold the upper half of the body



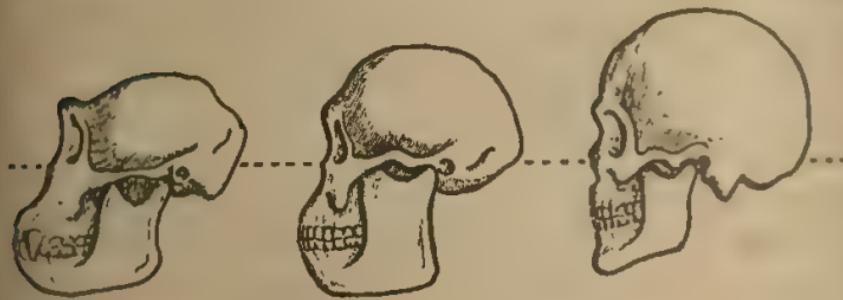
Side view of the left hipbone of a chimpanzee, a man-ape and man

erect. The pelvis itself became low and broad, quite different in shape from that of the tree apes, an important change of shape which allows the placing of muscles to guy up the trunk in its upright position above, and also the efficient hitching, below, of the powerful muscles of the human stern, which pull the leg strongly back as you step strongly forward. The difference in function between this human arrangement and that of the apes can be adequately understood only by seeing a chimpanzee, let us say, walking erect, and noting his difficulties.

Another fundamental change was in the foot. Here the thumb-

like great toe of the other Primates lost its opposability and lined up fore and aft with the others as the most important toe of all, and this made possible the fitting together of the bones of the mid-foot into a strong arch, with a single hinge joint at the ball. This also is of immense importance for true walking, in the force and length it gives to the stride—imagine running, in our fashion, on the loose-jointed foot of an ape, which can use only the ankle, and not the ball of the foot, as a fulcrum.

The evidence of this history of the ground-apes, apart from the nature of our own anatomy, is provided by an extraordinary and well-preserved group of fossil animals found in recent years in South Africa. These man-apes are known officially, alackaday, as the Australopithecinae. Some of them were of approximately our own size; some were distinctly less, standing perhaps four feet



Skulls of a chimpanzee, a man-ape and man

high. They lived in the open country, and apparently on a general, mixed diet, including meat. Their skeletons are incompletely recovered as yet, but the pelvis is known from several of them, and these hipbones, so different in the apes and men of today, unquestionably have the same form as the latter. This says positively that the rest of the body was similarly fitted to the special, two-legged walking gait which distinguishes humanity.

At first glance, a man-ape skull looks like that of an ape. This turns out, however, to be due to its small brain and massive jaws, and the situation will bear a closer look. The brain is well below

our own in size, but varies from that of a gorilla, which is larger than any of the other apes. Also, the head is relatively large, the position of the markings of the neck muscles in the skull, as well as the entrance of the spinal cord, shows the head to have been carried definitely more erect than in the living apes, and more so than in ourselves.

The jaws in some of them were enormous, but they, like our own tooth rows, are seen to be broad at the back and narrowed in front. Also they are equipped with smallish incisor teeth, and with canines which, like our own, do not stick up decisively above the others. Now we and all the apes are closely related, and distinct from monkeys, in the details of the crowns of the teeth, especially the molars, and this is in fact a principal way of knowing where to place a fossil fragment. Yet in spite of these hominoid likenesses, we and the apes each have our own special characteristics of the molar teeth, and here the man-apes are no less though their teeth are, side with us.

Finally, careful examination has been made of a lot of the minor details in the construction of the skull in which we differ from living apes, and here again the man-apes show that their likeness to us in being erect walkers is not a coincidence, but rather that they can only be our very close relatives.

Therefore the australopiths tell us several interesting things. They show us—something we might have guessed—that there was a true line of ground-apes, starting perhaps from an early and rather general hominoid form, to which we can haphazardly assign parentage. And they show that the essential piece of evolution was the walking gait, and the bodily features connected with it, and not anything connected with the brain or the jaws. The latter in function was the signpost which caused a split in the hominoids and gave rise to the line leading eventually to ourselves. And that is how the man-apes have become the missing links in the missing links; we can say that they are apes who have become men, or else that they are men with brains and jaws of apes'.

Nevertheless, these australopiths are not actually men.

the "missing link" between ourselves and the apes, or even a link between ourselves and still earlier forms, to tell us the kind of animal we are. "Hominoid," as I have said, covers all those non-monkey higher Primates with an overlapping tail, and various other signs of mutual relationship. A slightly different word, "hominid," is used to cover us men, living or fossil, small-brained or large, hairy or not.² "Pongid" which applies to the big anthropoid apes.³ The main evolutionary difference between them is the degree of their climbing commitment, and obviously the man-ape is a good hominid.

At present nothing else is known about hominid history. The first South African fossils existed very recently, a mere 100,000 days or less, and are probably a hangover from the time in which our own ancestors passed, possibly not long ago. When did the whole hominid line actually arise? This is not so recently. Some on the other hand, go so far as to say that the hominids and pongids never were one, and arose separately from the lower, lemurlike Primates of the Eocene. But this is extreme because of the many general and detailed likenesses between the two branches.

We can expect certain radical differences such as we find in the apes today when we consider the radical shift from tree-hanging to ground-walking. This actually is one of those tidal-beach situations in which some rapid evolutionary striding would have been possible since the beach, or middle ground, would be a poor place to be. The man-apes had already made the crossing. And we shall expect a washout here, with very little chance of finding any trace of early forms. Time, as usual, will tell. Just as a matter of interest, we might say that the basic split took place at a time when the apes had not yet got too far. For the australopiths and ourselves seem to have been strong in the way of little, seemingly random distinctions from the anthropoid apes to suggest that the hominid

² The families into which the hominoids (Hominoidea) are divided are the Pongidae, the apes; and Hominidae, men.

line has been evolving by itself for a respectable time, and not only for a few yesterdays.

All the above discussion centers on this interesting question: When and how did we become human? You have seen what we know of the answers. The question itself is actually rather pointless. Man of the modern kind is not old, nor is his way of life. In studying him, we must realize that his nature and existence came to be what they are very gradually—one of the things I would like to make clear in this book. In one important sense, we can say that we began to be "human" when we began to be "hominid"; that is, we began to be walking animals, with all the consequences, back sometime in the Tertiary. We have been working at it, in various ways which I shall turn to later, ever since. The man-apes had mastered the business of walking, and were apparently giving signs of undertaking another vital trend—enlargement of the brain—when they vanish from our view.

More important, by far, is the question of what it is to be human. We have taken a look so far only at one aspect of this, the purely evolutionary, structural one. Nevertheless, it is well to grasp the meaning of this physical heritage from our entire past. We have the superb and flexible body organization of the mammals. We have the rather simple, uncontracted forelimbs of the Primates, with their enhanced power of grasp, and also their emphasis on the sense of vision. We have the particularly wonderful eyes of the hominoids and also their modifications for an upright torso. We are now seen, in our own right, to have enormous brains, small jaws, upright heads and a body suited throughout to erect walking, not only in the torso but in the pelvis, legs and feet as well. Above all, along with the brain, we have the primate grasping forepaw freed completely—not partially as in apes or monkeys—from its ancient obligations in locomotion. We have—there is no simpler way of saying it—the brain and hand of man.

2 *The meaning of society*

There is, of course, more to being human than having a human body and a big brain. The side of humanity just considered could be studied as well on a dead man as on a live one—better, in fact. We are not human until we begin to behave human. And here also we have a wide background from nature.

We have, obviously, the same vital needs as other higher animals. We have to eat and breathe, with some regularity. We have to keep warm, at least above certain limits. We have the urge of sex, so that we shall not get absent-minded about reproducing our kind. Now many mammals, and certainly the higher Primates, have found advantages in combining to meet these needs and so forming social groups. Sexual activity, evidently, is a joint undertaking, but this can be casual. Many animals form more definite groups for the help this gives them in rearing the young, getting food, protecting themselves and so on. Monkeys, as we shall see, manage a still more efficient life in this way, and show that their social tendencies are an important evolutionary adjustment, like their hands, eyes or other body structures. And these, his highly social relatives, show how basic is the social nature of man himself: It is much better to observe living monkeys in action than to go in for speculative maulderings about the development of the social instinct in long-dead ancient man.

We have some excellent accounts to turn to. Professor Zuckerman kept an eye on the doings of colonies of baboons in the zoos in London, Paris and Munich, which had been allowed to arrange their own affairs, and made notes on what he saw. What he saw

was disgusting and brutal, but instructive. He saw, as any zoögoer may, that they are large and powerful animals, the males distinctly larger than the females. He saw that the males do not hesitate to take advantage of this, and dominate the females completely. The males also differ among themselves in size and fierceness, and there is much fighting. But Zuckerman noted that there was not as much fighting as might have been expected; not an endless tournament which would leave only one bleeding survivor. Instead, he saw a fine example of the famous "pecking order" of the henyard: everybody is a bully, but every bully knows a bigger bully on sight, and defers usually without argument, so that one is dominant and the other submissive and non-provoking, and there is actually a sort of rank order of dominance throughout the group. Thus there is a *modus vivendi*, or a state of armistice.

The organization of the group itself and the relations between the sexes express this extravagant development of dominance. The dominant males hog all the females, so that while some have one "wife," others have small harems, and the whole arrangement is semi-permanent. One can almost measure the relative dominance of a male overlord by the size of the sphere of influence he casts about him. Not only must he constantly dominate his several females, so that they do not stray more than a few feet from him and even sit patiently by while he eats his fill; he must manage all this and still have enough dominance left over to repel questing males. Fortunately for him, of course, other males of equal or greater dominance rank likewise have their hands full. And what about the extra males, at the low end of the scale? They are bachelors. But strangely enough, for the sake of company, such a one is allowed to attach himself to a harem group in the capacity—strictly—of friend of the family, and as long as his demeanor remains innocent of the romantic spark, serenity prevails. In fact the status quo is peaceful, and has its major upsets in case of a death in the group, since a widower may try to make good his loss at the expense of somebody else's harem and, on the

other hand, if a male overlord dies, the bidding for the hands of his widows will be ferocious in the extreme.

Now it is to be seen in all this that the group has, at any time, a well defined and well-knit structure, and that it is very "social," and you can allow yourself a little relaxation in your usual appreciation of the word. It is an ugly picture of terrorism rampant, evident to a casual visitor, but it has its uses. I should say that a primary one is this: the factor of dominance allows the group to exist and function as a group, raising the young and getting such other advantages of group living as I mentioned, without destroying itself through the simple savagery of the largest and best-developed members; while at the same time it allows that savagery and fighting power to exist for the purpose of leading and defending the whole group when necessary in its natural life.

But there is more to the meaning of "social," here. Zuckerman has pointed out something of importance: he observed that the individual baboons never move at random, but always with relation to the other baboons of the group. Infant to mother, of course, and vice versa. Female to male, always a female keeping close enough to her overlord to preserve her from the appearance of straying, and keying her actions to his. Male to female: the watchful or the lustful eye. Male to male: all the nuances of privilege and of circumspect behavior. Altogether, the action of any animal at any time seems like the complicated sum of all these relations and the animal's own individual personality plus his needs of the moment; it is as if each has his special electric charges and fields, all interacting in common to determine the way the members dispose themselves about.

These same complicated relationships have been thoroughly well observed among other monkeys, especially rhesus macaques. And, note well, the very same thing has been seen by alert ethnologists studying simple human groups, such as aboriginal Australians, here of course without all the baring of teeth and with much reference to rules and customs relating to sex or age. This may not actually surprise a novelist or a dramatist. Nevertheless, sociologists have for some time been at work, with such

equipment as timing gadgets and specially arranged rooms, trying to analyze the same sort of varying interpersonal behavior of people found in or around one of the world's most civilized communities (Harvard, if you must know). But that is another story. What concerns us here is that there should exist such an intensity of action and consciousness among the individual baboons of a group, with such a high degree of organization and adjustment.

The mellowed howlers

The baboons may be, present company excepted, the most evil of the Primates. They are at any rate not the model of all the monkeys, though others, like rhesus macaques, are not far behind in mental and physical cruelty. Professor C. R. Carpenter investigated the howling monkeys, and found them less offensive, to us and to each other. Baboons would be practically impossible to study carefully in the wild, because they are unapproachable and move rapidly. Howlers, on the other hand, cover only short distances. They live exclusively in the trees, never coming to the ground, and each band is strongly attached to its own home, a patch of forest less than a mile square, which it ordinarily never leaves. Howling monkeys are among the largest monkeys of the New World, and while they are not unaggressive, they prefer barking to biting. Their Adam's apples are greatly enlarged, and with this abnormal voice box the males can produce a roaring and howling so loud as to be unnerving even to a person who knows what it is.

Carpenter went to the island of Barro Colorado, in Gatun Lake in the Panama Canal, and for several months he painstakingly watched and recorded life in the various howler bands on the island. Like Zuckerman, he saw the individual monkeys of a band constantly interacting, moving and behaving with relation to the other individuals according to their mutual ages, sexes and general social statuses—the daily calisthenics of social living. But unlike Zuckerman, he witnessed a calm and harmonious disposition

in each group, with co-operation the rule and with dominance and aggressiveness notable for their absence.

Howlers could be perfectly described as lotus-eaters if only they ate lotus. They eat everything else of this nature: flowers, buds and fruit; they spend their days eating, playing, napping and enjoying themselves. Their home is bounteous, and they may go from one kind of tree to another as we go from one course of a meal to another; they have still other preferred trees for sleeping. All their travel, of course, is through the branches, and they cross from one tree to another where the branches intermingle. This is not always perfectly simple, even to skillful climbers and jumpers like the howling monkeys, and the way the band manages is a good illustration of the kind of co-operation that exists within it.

The group proceeds roughly in file, with the mothers carrying, herding or otherwise looking out for the youngest. The older males, few in number, fan out ahead when there is any doubt as to which direction should be taken, or as to how a crossing may best be made to the next tree, each of them looking for a pathway. This is not competitive, although the males do exert a degree of control over the band as a whole. A leader who has found a suitable path will make a clucking noise, whereat the others break off their search and all get into line behind him. If, on the journey, a young monkey tumbles out of the tree into the terrors of the jungle floor, the males immediately gather around above the spot and howl in unison, to frighten off jaguars. One reservation here: I am talking about co-operation, not gallantry; the males howl lustily, but it is the mother who is allowed to make the actual descent to the ground to retrieve her pride and joy.

The collaborative behavior and the lack of elements of dissonance are evident in ordinary "family" life. The howlers seem to lend themselves to clichés, because we can say that a band is one big happy family. There are, for reasons not clear, more adult females than males, but they do not form harem groups like the baboons; there are no standing associations of this kind, and con- practically speaking, all the males are men-around-the-house but

none are husbands. None are "fathers"; all are "uncles". So, w^h sex fulfills its indispensable function, it does not rear its head; as a spur to possible competition, or to the express dominance, among either males or females, it has been pushed sternly into the background.

Let us look in on a howler band around midday, as it is coming to the end of a long morning meal. Hunger has been allayed, so the older males are feeling the need of a snooze, they are dispersed here and there in comfortable positions on the branches. Mothers are occupied with their younger children, perhaps teaching them what and how to eat; they may be clustered excitedly around a mother with a brand-new baby—an object which seems to have the power of well-nigh deranging any female Primate. Like monkeys, apes and men, howlers develop slowly, they are carried around by their mothers for about a year after birth, and are not fully independent for about three. The older youths of the band are active; and play together constantly. There is general roughhousing, hanging by tails and scuffling, and chasing one another around. It is typical puppy behavior, and friendly; if it gets too rough, and particularly if there should be a cry of pain from one of them, an older male is likely to give a warning grunt, which will serve to calm things down. This is not simply elderly impatience, however, because otherwise the adult males give a picture of indulgent unclehood, allowing small fry to climb all over them and generally be annoying. When the human male would end this by saying, "Beat it," the howler may extricate himself by playing ostentatiously with the little pest for a moment, which will ordinarily start a general melee of the young, from which he can retire to keep one eye on the situation while he gets furtive winks with the other. Howler males would seem possessed of a transcendental affability, but then howler males never have a bad day at the office.

It might appear from their domestic relations that howler monkeys are by nature gentle to the point of being effete. This is not so. As the young males approach adulthood, signs of fighting behavior intrude themselves into the previously good time.

young bucks do not, however, begin to fight more often; they simply play less and less. More important, the antagonism prevailing within the band is offset by absolute antagonism between bands, with the males taking the leading role. As a result, each band has its own home, and guards it jealously against all other howler bands though not, oddly enough, against herds of animals or monkeys. If invaders appear, the males leave the band and get out in front and howl violently, being answered by the males of the other band. The battle is fought by howling, not by bloodshed, and ends with the invaders finally retreating to their own territory, evidently from a feeling of strangeness or weakness of position at being in unfamiliar trees. Thus the home band preserves not only its food supply but also its very integrity, since bands are kept strictly separate by their mutual antagonism.

How is this anger and aggressiveness, so manifest when stranger groups come together, suppressed, especially among the males within the band itself? Obviously, by the social education they undergo as they grow up. In such a closed band, every member is a completely familiar object to the rising youth, and particularly his own age-mates, with whom he has been scuffling intermittently and safely for most of his life. This complicated fitting together of personalities and smoothing out of relationships involves natural male rivalry and the antipathy between unfamiliar tree-trunks, such as nevertheless comes promptly into play when a stranger band shows up. All of howler behavior relates to this process of play school education and the achievement of harmony: the absence of competitiveness over sex, the fostering of attachment to some members of a well-defined group, and the working together of the males in guiding the group, in howl-fighting with other groups, and in howling to save fallen children.

Play mode is more than a convenience; it is a necessity. Consider the case of the solitary stranger. Carpenter never saw a lone male, but he did observe an occasional stray male, without being able to tell how he came to be that way. Such a one was obviously discontent in his solitude, since he was generally engaged in trying to join one of the bands. Easier said than done, however, since

he is usually howled at and driven off by the males. If he persists as he is apt to do, for four or five months the resistance to his stay finally diminish and end, and he will be allowed to remain in the group. He has been adopted: he has gone through a complete version of what the ordinary howler goes through in growing up and has become so familiar, through patient hanging around him, that he might as well have been born and raised in the group since he no longer arouses the aggressiveness of any of its members.

This incident puts howler sociability in a nutshell. It demonstrates the need felt by an individual to be in a group. It shows the natural antagonism between howlers, particularly males, and also the countering influence of the cohesiveness of the group, and the existence of "group-consciousness" of an unconscious sort, and the process of natural education by which it comes about.

Taking them together, the baboons and the howling monkeys must come near to being the extremes in the matter of basic Primate social organization. But the contrast may actually be more instructive because of the underlying likenesses. More than is apparent, the two kinds of monkey share some important elements of behavior, and differ in the emphasis they have placed on them. We are appalled by the ugly cruelty in which baboon society functions, while we beam benignly on the happy howlers who lead their lives, it would certainly seem, according to those kindly injunctions which we have honored more in Greek than in grandmother's samplers than in our own activities. However, it is reading our own ethics into animal psychology, a poor habit but a sloppy one. Both baboons and howlers have the capacity for aggressiveness and dominance, both have the great primate adjustability, psychologically and temperamental, to others of their species. The baboons happen, in their basic natures, to emphasize the first, while in howling monkeys the first—the aggressiveness—has been heavily repressed. The second. The "organization" of their social relations follows from this: among baboons each individual is riveted to place in a cast-iron social order, and "marriage" is a sort of polygyny with

expression of dominance. Among howlers there is easy peace of the group, helped by outside pressure (stranger males) with dominance doing no more to differentiate individuals than to give the adult males some control over the actions of the group. "marriage" is promiscuity. Note the important fact that in each of the two species *has* a very definite organization, and that in each it works efficiently. We do not have to look at either of them, or note that promiscuity works nicely in other primates. We are neither howling monkeys nor baboons, nor are they human.

The jealous gibbons: no triangles allowed

We are nonetheless Primates. We are closer, in physique and in behavior to the apes than to these monkeys and we are, fortunately, able to know a good deal about the behavior of some of them. Dr. Carpenter, our most industrious foreign agent among the primate species, finished up with the howling monkeys and then turned himself to Siam to study the gibbons. This was no easy task. Gibbons, like howlers, live exclusively in the trees, in their own little world. However, also like the howlers, gibbons are "territorial," so that the groups have their own territories or "ranges" and stay within them. Carpenter was therefore able to find strategic points, or to spot the same groups day after day, and patiently follow them around on the ground below. He found that gibbons live in families, consisting of a permanently paired pair and such of their children (born on the average of every two years) as have not yet become adult, of which there may be as many as four or five. But before we infer that we can conclude that gibbons are "monogamous" in anything like the sense that is to say, by custom—let us have a more careful look.

Gibbons are rather small, and attractively gentle as a rule, but when savage and with their spiky canine teeth, dangerous.

The sexes differ little in size or in self-assertiveness. Dominance is visible to a mild degree in the family, and more so when the groups come together and there is a vocal dispute over boundaries. Most important, there is evidently a strong aversion between two adults of the same sex: Carpenter almost never saw an adult full-fledged male or female in any group, even such as might be grown sons or daughters. It is evident that, as with the baboons, the male would drive off any other male; furthermore, the rule cuts both ways, and the female would drive off any other female, which leaves us with a total of two. So it would look as though a gibbon marriage arose by a process of subtraction, rather than one of addition as among ourselves. But this is not quite true, because Carpenter saw mated or friendly gibbons showing positive affection and pleasure in each other's company, and meeting one another, after having been foraging separately for a brief time, by what can only be described as smiles and hugs (the brachiator's hug is done with one arm and two legs, but otherwise compares well enough with our type). Thus there seems to be more to the association than the bond of sex.

Gibbons show us, not quite so clearly, the same elements of interpersonal behavior that we have seen already in monkeys: on the one hand, aggressiveness or dominance giving some animals a degree of control of the group, and the whole group a sort of natural patterning, which helps it to operate smoothly; on the other hand, sociability, or a strong adjustment and cohesion, or bonding, of the group itself as distinguished from other groups. These elements do not get the same emphasis as in the other species—the more equal status of the sexes in size and dominance produces a mating pattern different from that of the baboons—but the gibbon type of grouping is just as rigid in this way, as the others, and just as clearly an expression of the particular nature of the animal. In the other apes, particularly the chimpanzees, we see something of a difference, a sort of breaking up of personal relations, which seems to put them in an earlier and I should say more advanced, category.

The rambling chimps

Chimpanzees have been studied wild in West Africa at the cost of heroic efforts by Dr. Nissen. Watching gibbons is not difficult but watching chimpanzees is something else again. They are not territorial; they do not stay in the same area, but are truly nomadic and move rapidly, mostly on the ground, when in the zo. A group of them, resting, eating or even moving, will be well spread out in the trees or undergrowth, and most difficult to see individually; the only advantage they give an observer is the constant noise they make, chattering, calling and banging on tree trunks. This advantage goes for naught if they notice they are being spied upon, because they dislike it intensely, and will stop their noise, put on a burst of speed and be over the hill in no time. Nissen was thus quite unable to study any one group systematically and repeatedly, and so could not bring back the kind of voluminous notes, on the day-to-day behavior toward one another of specific members of the same group, which Carpenter obtained. It is remarkable that he got anything of worth at all. The burden of his findings, as far as social behavior goes, is that they go in bands averaging eight or nine, with some larger and smaller, that there was no obvious or striking kind of mating or courtship, although there were fewer adult males than females, that there might be only one male adult in a group; and that they traveled peacefully and co-operatively. He did not report any kind of competition or aversion between different groups, and he was convinced that two groups might mingle temporarily without separate. He did not report signs of dominance among the members of a group, though this would have been hard to see under the circumstances. He conveys, in fact, a very strong sense of independence and flexibility of movement of the animals, wandering around where they felt like it and apparently keeping in touch by means of all the noise.

Fortunately we do not have to rely on such peekaboo evidence to know more of chimpanzee nature. They have been studied intensively in captivity, in a great variety of ways, because their close relationship to ourselves makes them so exceptionally important; the only drawback is that captive apes are, after all, not leading natural lives. They are, as everybody has noted, highly emotional and sensitive animals, and one needs very little experience of chimpanzees to realize the force of their interest in, and reliance on, other chimpanzees or such near-chimps as human beings. It is hard to convey the meaning of this briefly. You might almost say that chimpanzees are like us, but more so, in the degree to which their behavior relates to that of others. Dominance is present, with the larger male tending to dominate a female. This is not invariable, however, and a female can use the advantages of her sex temporarily to dominate a usually dominant male. Furthermore, dominance is less obvious than in the monkeys: one gets the impression that the more forceful and positive individuals are not simply the most blatantly aggressive, and that the interplay of personalities has a complexity that suggests the human. A chimpanzee group, in other words, has, like other primate groups, a definite arrangement of its individuals which rules activity, but which depends on other considerations besides brutishness. It is unsafe to humanize such traits, but they give the appearance of amiability, general vigor, self-confidence and so on. Special friendships and enmities are plain. I might say that Professor Yerkes, the great authority on chimps, has never hesitated to emphasize the humanness of chimpanzee personality and responsiveness.

The other apes support this analysis, but orang behavior is almost unknown, and gorilla behavior largely so. If you barge in among wild chimpanzees they will take to their heels, and your day's work will be over. If you barge in among gorillas, the chances are fair that a gorilla will barge right back, and your life's work may be over. Nevertheless, gorillas have been discreetly followed in the jungle by trained observers. The result was slight because, like chimpanzees, they move quickly and over

long distances, and if you give them the leeway which is their due you are hardly likely to see them at all. They certainly live in groups, some large. Apparently groups are not hostile to one another, and adult males behave peacefully and co-operatively. Some were once seen to be holding an active powwow, barking and chest-beating to one another, over what to do about the visiting scientists, which suggests the joint leadership seen in howlers, and not the automatic dominance of some monkey species. Captive gorillas have until recently been so difficult to raise that little more about their mutual behavior is known from this source. There can be no doubt, however, that they are essentially like chimpanzees (and ourselves), the difference being that gorillas are on the whole more repressed; there is nothing repressed about a typical chimpanzee.

And what is the meaning of all this for us? It lies in the understanding of what a society is, among the higher Primates. They are animals who need to be in a group. As Köhler has said, a lone chimpanzee is not a real chimpanzee at all; he is more like a prisoner in solitary. Further, they are animals with a high capacity to form groups, to become educated to one another by an actual learning process which leaves strangers strangers but which gradually interlocks and dovetails the personalities of the individuals of that particular group, to make a tightly knit whole. Dominance simplifies things, apparently, and may make the group a more efficient one, like army discipline. But at any rate, such a psychological interweave as this is a true society, and not just a collection of animals.

It is totally different, of course, from the societies, so called, of insects, whose actions are pure instinct and as much a part of them as their heads or legs, and in which there is no such thing as variation or adjustment among the individuals. And although social relations and such phenomena as dominance are widespread in higher animals, they are rudimentary outside the Primates, who are by nature more disposed to make use of them. For one thing, the higher Primates breed at all times of the year, so that the protection of infants is a constant problem. For another thing,

they are large-brained and intelligent. Now we are given to thinking that brains and intelligence are for doing arithmetic in the head and for exercising logic. And so they are, but that is a very narrow a view. A large brain signifies, first, a high nervous organization; and a high intelligence, I suggest, means primarily the ability to react successfully on a very broad scale. Broad intelligence would include the primate characteristic of complex adjustments among individual animals and among animals into a society. The monkeys and the gibbons do not seem to have this quality. They are somewhat rigid in their social patterns, and dominance seems to play a marked role in many species. Chimpanzees,⁹ as I said before, seem to manifest greater fluidity in the individual's position in his relations with others, still with enormous cohesiveness in the social group, and I consider this to be the result of their particularly high intelligence. This, therefore, is the kind of society and the trend in its development, that points toward our own.

We can hardly understand human social relations until we see that our basic social institutions are imposed over a powerful set of natural inclinations, derived through our biological evolution, to act in the very ways we act. The other Primates have shown us what these inclinations are: the need of individuals to be in a society and to establish secure, specific and continuing relationships with one another. The institutions we have gradually developed as human beings did not force us to come together in groups, or to take our various kinds of status; rather, they have modulated, channeled and made more effective the kind of society we would go in for anyhow. Like other Primates we are social and have societies, because of our nature.

3 Culture: how we behave

It ought to be plain by now that man, in his physical nature, is very much at home among the Primates. If he did not do certain other things which mark him off from his brothers, this book would be finished here. But he does: almost conversation we take, all day long, is something which apes, the majority of the other animals, cannot do. For man is a creature

of culture. I am not indulging in a piece of outrageous snobbery, hoping that the gentle will not find out what I have said. I am not trying to say that we have better breeding than they, or more appreciation of the finer things, for culture, in this proper sense, is something much broader, and all men live by it, even though some live worse than others. It consists, simply, in all the inventions, and all the conventions, ever made by humanity. Culture is what makes us to be human.

Without it we would simply be another kind of animal, a kind of ape, living like the other kinds in small groups, true to their uncultured societies. Every band, or society, of apes behaves in the same way, in its manner of eating, of drinking, traveling around, and in its noisy social interchanges. This is all characteristic of chimpanzees, and it is determined by their general nature and capabilities. The case of man is different. Every human society has an added stock of behavior, which it creates and modifies, the other, and it is this added stock which we call culture. Furthermore, this overlay is never the same for two different societies. Why? Because it is created and never becomes inbred. It is not in itself bio-

logical; it is "inherited," which is important, but it is *inherited* like property, not like blue eyes. Culture is all those things which are *not* inherited biologically.

Instead, culture consists of everything which has even been accepted as a way of doing or thinking, and so taught by one person to another. Because that is how it is passed on, and—this is vital—that is how it can change and grow so readily. It is the entire knowledge, and patterning of behavior, which human beings have, and of course it must be taught and learned for the very reason that it is not inborn. The teaching and learning can be perfectly direct, like arithmetic in school, or it can be so subtle as in adopting attitudes from parents and friends, as to be quite unconscious and unrealized. That does not matter; man is the only animal capable of both teaching and learning this mass of conventional patterns. As any psychologist will tell you, animals react to a stimulus according to their nature and needs, and also according to their experience or conditioning (Pavlov's famous dogs drooled at the dinner bell as well as at dinner). So also do we, but we alone have this extra, socially shared screen between us and our actions. And of course since we alone can teach and learn culture, we alone can invent or create it effectively. Once started, however simply, there is no end to its complexity.

Let us take some simple examples from what would be a very simple human culture. A digging stick of a particular kind, for digging up wild vegetables for food, is culture. So is using a skin for keeping warm. So is the idea of appointing a war chief for the group, or the idea of marriage. Now apes might give the impression of having or using these things. They will use sticks readily in captivity, given sticks and something interesting to use them for. You may have seen a young orang in the zoo rapturously using a gunny sack for a blanket. As you know, many Primates will defer to a dominant animal and take their cue from him. And gibbons pair off permanently for mating. But there is a distinction. Different gibbon societies have no choice in the matter; their kind of mating is all the same because it is entirely controlled by biology instead of biology plus convention; it is in

their natures. That is why their monogamy cannot be compared with human monogamy, and why their mating is not marriage. So with dominance and leadership. As for sticks, chimpanzees can use them in ways of their own devising, and even fashion them; in fact, fads of stick-using, particularly for mischief, may sweep through a captive chimp colony. But this actually happens at random. It is not created, maintained, handed on and understood, as a regular prop of chimpanzee life.

To men, however, such things can be handled not only as objects but as ideas. A digging stick is not just a stick you happen to have around. It is a digging stick for digging vegetables. You are welcome to chastise your wife with it, but if you do, you are beating her with the *digging stick*. Furthermore, the important thing is not so much the stick as the pattern for the stick. It is a pattern of behavior. The social group possesses it; we know one uses a digging stick for vegetables, and we know what the best kind of such stick is. This known pattern, which breeds digging sticks, is the actual culture item. The same for a skin robe, or a war chief, or a form of marriage. Man is able to maintain these ideas, to change them, and to add to them. So I do not feel rash in saying that there is, in a way, less difference between Buckingham Palace and a cave with a fire near the entrance than there is between a cave with a fire near the entrance and a cave in which nobody can make a fire.

Brains and their uses

- How does it happen that men can handle culture and apes cannot? Because of greater brain power, certainly. We have brains larger by about three times than the great apes, and that is a huge difference. We all have the same general pattern of the cerebrum, the outer layer, which takes care of the senses, of control of the muscles and of higher processes. Sight and hearing, an itch in the scalp, a command to the toes to wiggle, each has its special part. Around such special parts there are other areas of the

brain, more general, in which things seen and heard in the past are stored up, or special patterns of toe-wiggling kept; in still more general parts of these association areas, wider connection between such specific odds and ends can be handled. It is a little like going from the mail room busily dealing with incoming and outgoing stuff all through office hours, past the executive office, to the quieter research laboratory, which can take the resources of the business and come up with new ideas and ways of doing things. The association areas are already large in the higher Primates, and it is in these parts of the brain that the great human expansion has principally taken place.

Sad to say, this kind of thing is most difficult to study, and we still know all too little about the brain at work and at play. However, chimpanzees at work and at play do give us some idea about the end product, and about the elements of intelligence which underlie our capacity for culture, the chimps in particular showing us where they fall down and where we rise above them. As Yerkes says, we must be grateful for the existence of chimpanzees, who make fine, generally enthusiastic laboratory animals, and who are so like us: we know they hear about the same sounds, and that they see in the same terms, with full color and stereoscopic vision. Like us also, they are poor at smelling and good at handling. Only in apes can we find a usable smaller-brained near-facsimile of humanity.

You can hardly find more delightful reading than what has been written on the doing of chimps, from anecdotes about chimps living in the house to their report cards in the most carefully designed tests. I regretfully leave all this to other books, and confine myself to remarks on the results. Chimps are masterly imitators, both of one another and of human beings, being able to observe and copy whole patterns of action with the greatest of ease. Thus do they learn our own low habits, smoking and spitting. Köhler saw an anthropoid victim of the Tom Sawyer motif: the chimp absorbedly watched a workman painting the enclosure, and, when the man temporarily went off and left his paintpot,

the chimp at once fell to and painted a large rock in the yard, and did, what is more, a grade A job.

Therefore they can be trained at all sorts of things, particularly those it which they would be naturally adept, as long as they are interested or can be bribed. The idea occurred to Köhler that the apes might do their own housekeeping, and he set one of them to picking up the banana peels in the yard at close of day. The chimp took a basket and went at it like a demon janitor the first day, but found it all too much like work in the next day or so, and after four or five days he could not be prevailed upon to go from one skin to the next by cajolery, threats or brute force.

Chimpanzees remember well, recognizing people or apes after long periods, and also remembering the solutions to puzzles without difficulty. Because of all this information, Yerkes does not like to have them considered incapable of culture. He notes that when the colony was founded at Orange Park, Florida (now known as the Yerkes Laboratories), the pioneer chimpanzees were shown how to work the drinking fountains, and through the years ape has aped ape, and no further instruction of new generations has been necessary.

But all of the above manifests what chimps can do naturally and well, the sort of thing in which they merely excel various other mammals, who do similar things well also. It does not reveal them at the height of their mental abilities, or show where their shortcomings lie. This is what the more rigorous problems are made to test. Now, typical animal learning is done by trial and error: a rat in a maze tries again and again, gradually having the right moves reinforced by success and his wrong moves checked more and more by failure, until his successful runs become more numerous and at last he makes no mistakes. This is a simple kind of learning and problem-solving, and is practically thinking with the muscles, or with the muscle-controlling part of the brain; it is like the thought, or lack of it, we use to get us home from the bus stop after ten years of doing the same thing.

But consider a problem, an old one though a good one, which has repeatedly been put to chimpanzees. The bait, a banana, is

hung well out of reach, in fact where the ape can reach it, by bringing over two boxes, which are provided, and by stacking one on the other to climb upon. Now trial-and-error would not solve this, without the intervention of earthy logic, since the only approach would be jumping up toward the fruit repeatedly from underneath it until exhaustion or frustration ended matters. That is all a dog could or would do. This is a logic problem for chimpanzees, but most can solve it. And it demonstrates, many claim, an advance in mental processes from trial-and-error work to insight, which means fitting possible activity to the situation in the imagination, not in actuality. It means, obviously, using parts of the brain less closely related to muscle activity proper.

See how a chimpanzee would make an ideal solution of the problem. He might begin with a few jumps, for size, which he would at once observe to be unfruitful, or unbananaful. Then rather than sheer muscular failure, would stop his jumping. He might not even try a jump. There might follow evidence of continued attention to the fruit, or there might be a long pause before anything else was tried. However, the moment would arrive when the ape's experience with boxes would suggest using one, and he would reveal the fact that this was a truly mental solution by the directness with which he would try to carry it out; there would in other words, be nothing random about his actions, but rather a perfectly transparent awareness of what he was doing. Discovery that the height was still not enough has been known to cause an immediate tantrum, showing even more positively that the solution was all there in the head, with the picture of success. Going on to the use of the other box would be a repetition of what had already been done, in similar, clear-cut steps.

Abstractions and symbols'

This is a sound example of what an ape can do in many such tests, quite unapproached by other animals except monkeys. The

An orangutan's eyes see the situation, just as a dog's do. (They see it more completely, as to color and depth, which is certainly important.) But the chimp himself grasps more of it, because his brain is capable of applying more things to it. Notice that he does not respond, in ordinary mammal fashion, directly to what he sees by endless jumping, or simply as a result of experience or training, like going to ring a bell for which he will be given the food as a reward. Instead, he is also using, with varying degrees of consciousness, some abstract elements of the situation: the usually unjumpable gap between him and the banana, and the availability of the box, and the property the box has of serving to close the gap. He is also at the same time a little bit conscious of himself at work, so to speak, so that he hits the ceiling figuratively when he fails to reach it in reality, contrary to his expectations on using the first box.

Thus the apes can make and handle abstractions to a significant degree. They show it in other kinds of tests perhaps more distinctly, as in grasping the principle that the middle box or door is the right one to choose, no matter how many there are. They also seem to be superior in recognizing objects in a photograph, that is to say in a black-and-white, two-dimensional representation which would be meaningless to a cat or a dog.

But it is apparent that ape abstraction is done with the brakes partly on. Their obvious cleverness is the result largely of their particularly high ability to learn and memorize through the senses, which is an ordinary mammalian mental process. Take this problem: a chimpanzee is allowed to see food being put into one of a series of different boxes, and then led away, perhaps into another room, where this is done again, or into a series of such rooms. After a lapse of time he is turned loose to find the food. This test shows how good the chimp memory is, but it also shows that he will depend, whenever he can, on the position of the right box, rather than on any of its other properties, and this links him with other animals which respond similarly (providing, of course, that they are working to memory, without smelling the food itself). He does very well with his sight and memory, but he is largely doing what a

bloodhound does with scent. If the boxes have been shuffled around after he has seen them, the ape is all too likely to try the one standing in the same place in the room, where we would immediately see that someone had switched the round box covered with shiny red paper and the square one covered with green baize. It seems obvious to us to remember the color, and also those other somewhat abstract qualities of shape and texture. We can thus promptly learn to solve such tests, if the solution involves any shiny box or any round box. Chimps can too, but with more reluctance compared to using clues of space.

Therefore apes can deal in abstractions, especially if they are closely related to concrete problems. But accumulating abstractions and juggling them around—abstract thinking—is a much harder job, and here we have an advantage. We can keep tabs on our ideas, or abstractions, by using symbols to represent them, especially words. We are adept at using such symbols; the apes are very poor, even if they excel other animals. Without something to stand for an idea or abstraction, it is difficult to carry it around and apply it elsewhere, and impossible, of course, to give it to anyone else.

For example, a chimp is able with training to recognize colors, and to use them as clues to a problem, such as this: show him a colored patch, either red or green; red is a signal to press one button, green the other button. This is simple, when the ape can take the color as a direct cue. But make him wait a short while: he sees the red, and he recognizes it, but he must somehow bear in mind the simple fact of a color, and then apply it to something that has nothing to do with color in itself; it must be remembered simply as a fact. This is easy for us: we can just say "red" to ourselves, consciously or unconsciously. But it is a tough problem for a chimp and it is clearly near the limit of his capacity to use symbols at all. Otherwise this capacity is limited to symbols relating to position and space, something of which other animals are also capable.

Frankly, we must remain vague about such important matters at the moment, because our most persevering psychologists are

still only in the fringes of the jungle of the brain and how it works. But we have to try to describe man's ability to use culture nonetheless. It is clear that we make and use symbols freely, that apes give signs of being barely able to do this, and that our advantage is our much larger brain. It is also apparent that these things—abstractions, and symbols of them—crowd into the area between something we experience and our reaction to that something, and so govern our behavior, and make it "human" or "unanimal." Only because of our ability in these things are we able to invent, to keep and to be governed by the patterns of behavior which make up culture. Finally, only because we are social animals can culture exist as it does, the property of an integrated group of animals, affecting them in common and being maintained by them generation after generation.

So it is clear that we get our human quality from natural, animal sources. We would be nowhere without the hands and eyes of the higher Primates. We could not have culture, a social thing, unless we were one of the social Primates. Nor could we have culture if we had not expanded the cerebrum of the already large hominoid brain or, in practical terms, become able to deal with abstractions and symbols far beyond that place in the road, which barely points the direction, at which a chimpanzee gives up and turns back: We came by these things through straight forward evolution, in continuous descent from our simpler Primate forebears, but in us their working jointly gives us culture, something new in nature.

Culture is only human

This was obviously gradual, not sudden. Culture had a beginning. There is a great gap between ourselves—any living man—and any living ape, so that we can only make suppositions as to the steps we took. We know from their skulls that men living in the remote past were more primitive than we, and that they had more primitive cultures. But we can judge very little from this.

We cannot test these men as we can apes, to see what their actual capacity for culture was like.

Culture has continuously grown. From the very beginning man has used it to solve his problems and make his life easier. This also emphasizes its special nature: it is a new, largely mental way of reacting to the environment. It is radically different from the old system of changing body form, or native abilities, in response to natural selection, and thus remaining closely bound to nature. Culture is a way of departing from nature, of putting a protective layer between man and nature, whether in concrete things like clothes and houses or in less conscious inventions like social customs and religious beliefs, which make for more efficient and happier living. The tip of the wedge was perhaps things like the use of clubs, fire and language. Just what they were in detail it would not be safe to say, but it is certain they had the characteristics of culture, and served to improve the state of man, making him more powerful (weapons), broadening his diet (cooking), and so on.

From such a point as this, of course, culture has expanded enormously, becoming an ever fatter cushion between man and his environment. But now see what happens: the bigger it gets, the more culture itself *becomes* the environment. Culture is not to be thought of as a stock of clever ideas out of which we are continually making selections for our own benefit or delight. On the contrary. Man invented culture, and culture promptly took charge of man. We do what culture tells us to, whether we quite know it or not.

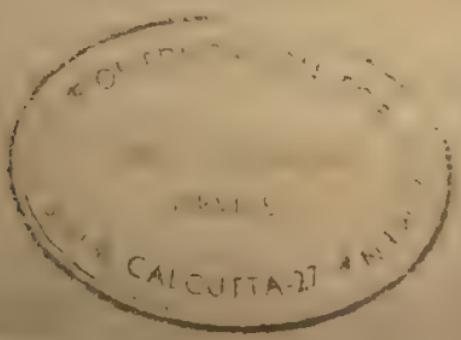
In the first place, people have never been too much aware that there was such a thing as culture. It goes back before history; it has seemingly always been there; they take it for granted. It actually grew up out of the sum of inventions and adjustments they happened to make, and it could not have followed exactly the same course for two different societies. So no two societies have the same culture. And each one thinks its own is the obvious and natural way of doing things. This is not simple preference: it is because human societies, unlike animal societies, are based

on their own cultures and cannot continue to exist, as human societies, without those particular cultures which have continuously sustained them.

Why must a society have that particular culture? Because a society has to be a group of individuals, and the individual grows up as the prisoner of his culture. He could not possibly escape it. A human being is no longer born simply as a social animal, like a chimpanzee; he is born into a complicated world he did not make, among a particular set of people he did not choose. Culture is practically his whole environment; culture lets him breathe as he sees fit, but it even tells him what to eat, and how. He becomes a cultured creature of necessity, and of necessity his culture is that of his own society—how could it be that of any other?

I am satisfied you would not be seen dead dressed for the street as a Hungarian peasant, or a Tibetan monk, or even in the clothes of your own great-grandfather. Why should you object to appearing in such a fashion? You would be as warmly or as comfortably dressed. But do not be confused; you were right the first time. It is not natural, and there are good reasons why. A culture contains far more than any individual could possibly reinvent, or satisfactorily revise, and it forms a consistent whole. An individual needs all of it, not bits and pieces, and he cannot live outside of it in any conspicuous way.

But this is becoming complicated and abstract. There is a great deal to be said about the nature and workings of human culture, but I shall say no more of it here. I shall tackle the history of culture later on; here I have tried to show the relations between culture and society, and above all the place of both of them in the evolution of man.



4 Language: how we talk

There is one more noticeable difference between men and apes, or other animals. We talk, and they do not; that is to say, we have language. If Siegfried heard the birds talking after he had tasted dragon's blood, the dragon's blood must have been fermented. For language proper is culture, and out of reach of the beasts.

That is not to say that they do not communicate. In the first place, animals readily sense excitement, emotion or shifts in attention on the part of their fellows, and act accordingly. The Primates, as usual, are pre-eminent at this sort of thing and, according to those who know chimpanzees best, the understanding of a situation which can run through a group of them by means of slight attitudes, gestures and facial expressions is a marvel to see. And there is some evidence that this ability helps them considerably to co-operate, as social groups, in their natural surroundings—another manifestation of their high "intelligence." Nissen, for example, tells of being spotted by a single chimpanzee of a group, the others being hidden in the foliage. Chimp number one at once climbed up to where the others were; Nissen did not see what took place, but the whole band came down and trooped off, without trying to see him for themselves.

They have more specific means of communicating. Monkey mothers, for instance, signal their offspring with a gesture to climb aboard when they wish to go elsewhere. But certainly a principal method is actual communication by voice. Howling monkeys not only howl; they cluck to signify that a good pathway has been found, they gurgle if something suspicious makes

them apprehensive, they grunt if the kids play too roughly; and in each case others respond in the way appropriate to that noise. Carpenter could make out fifteen or more such distinct noises among howlers, each for a given situation, and he found a somewhat smaller number among gibbons. Again chimpanzees, though noisy, do not seem to have their communication so strongly patterned, and probably have more subtle and more fluid resources of expression.

Now all this animal business may be impressive, and useful to the species concerned but, taken together, it remains distinct from language. These noises and gestures are not words. They are signs, or signals. They do not simply convey information (abstractions). Rather, they fit some specific situation, and pull the trigger for some action connected with it.

Here is an example, again from the hard-working chimpanzees, which shows the breaking point. A box is rigged, and baited with the usual fruit, so that it can be brought within reach (up to the cage bars) only if two apes pull, separately but at the same time, on two different ropes; this was devised to see how well they can co-operate in work. It took a little teaching to get them started pulling, but once over the hump they proved clever at watching one another and timing their pulls together. After this, when the box was set up and shown to one ape, he could fetch a partner who knew the ropes by a little beckoning or making of faces, and a few smart yo-heave-hos would get them a banana.

But let him try to get help from a chimp who was strange to the problem, and no amount of frenzied appeal would convey to the latter what was wanted. The two stood helpless; the gestulating was empty of symbolic meaning, and only pertained directly to something which was in the experience of one and not of the other; it was even beyond the ability of the first one to try to symbolize his desire in effective pantomime. Yet certainly "I'll pull on one rope and you pull on the other" seems like the easiest sentence one could imagine in the mouth of an early man, being probable in situation and intellectually simple.

Even this might cause us to dismiss the chimpanzees too soon.

The more that is known about them, the clearer it is that they have a great many of the prerequisites for talk, in their capacity to perceive, to make associations, to see the need for communicating, and so on. They just do not talk. Viki, the chimp raised from birth by Dr. and Mrs. Keith Hayes at Orange Park, liked to go for automobile rides. At first the Hayeses always took along an abundant supply of diapers in the car, and Viki promptly adopted the habit, when she felt like asking for a drive, of going and getting an armful of didies and exhibiting them to her foster parents. She employed the same charade when the diapers were no longer taken along. And after they had been disposed of altogether, and she could not find them, she looked around for something similar, discovered some Kleenex, and made her desires clear with that.

Nevertheless, true language depends on symbols, not on signify. Take Professor Herskovits' definition of language as a *system of arbitrary vocal symbols by which members of a social group co-operate and interact*. Speech depends on our ability to make abstractions lavishly, to assign symbols to them and to manipulate the symbols at a great rate of speed.

Let us now take an actual specimen of language in operation. You, an American paterfamilias, wish to break the monotony at dinner with a morsel of idle news, and say, "I saw an overturned truck on the turnpike this afternoon." You yourself have a fresh visual memory, and even such sensations as the heat of the day; you remember what part of the turnpike this was on; it was a green truck and there were squashed grapefruit all over the place, and so on. You cannot convey all this economically; you take the main features, and abstract them from the scene, using only place, time and a general object.

You readily fish up and put into play the symbols which all the people you know attach to these abstractions: for purposes of production, the symbols consist of some very complicated motions of the tongue, jaw and lips made while you vibrate your vocal cords. The product of this, a modulated hooting, resounds in the dining room and impinges on the eardrums of your wife and children, reaching the auditory area of the brain as symbols—

this time in the form of sound patterns—which are familiar and easily recognized. They evoke the right abstractions and cause fleeting visual images of overturned trucks on the turnpike, but of different-looking trucks, on different parts of the highway, in the brain of your wife and each child.

The object of all this work is some fairly neutral information, not a stimulus to action. It may result in various responses: "Never hitch rides on trucks, children"; "Was everybody dead, Daddy?"; or the room may revert to the gentle music of knife and fork. You could have used a somewhat amplified set of abstractions from this scene, and you could have used a variety of alternative arrangements of the symbols. Whatever the case, you have given a demonstration of the full process of transferring abstractions from one individual to another by means of vocal symbols. The gulf between this and the parley of a pair of parrots should be apparent.

It is not as though the other Primates were actually mute, or lacked vocal cords or the other instruments of speech. Far from it. Both chimpanzees and gorillas, above all, are constantly using their voices in the wild, in a wide variety of calls and mutterings, though these are mostly simple vowel sounds. Moreover, several young chimps at Orange Park have lately been taught to say and use a few words (the same had been done years before with an orang), especially Viki. The standard vocabulary is "papa," "mama" and "cup." The apes have no trouble in understanding what these words (and many others) refer to, or in applying them properly. This still does not mean, of course, that the words are anything more than signals.

Now I should hasten to say that this teaching is not done with the notion of introducing speech to the chimpanzee tribe, or of promoting chimp-human relations, or with the crasser motive, which seems to have occurred to Köhler, of helping out with the servant problem. Nor is it expected to lead to anything spectacular in the field of shaggy dog stories. It has been done to study the basis of human language mechanism by probing and pushing chimp abilities as much as possible, to see what keeps them from

talking. And the result shows that the actual speaking, the production of disciplined sounds even so simple as "cup" (as distinct from a yell of pleasure or excitement), is a severe nervous effort. The word is spoken in a toilsome stage whisper, and at least one chimp developed a marked tic with his talk. Chimpanzees, for all their love of noise, do *not* take to language like ducks to water; instead of having the natural impulse and facility to expand and enjoy their vocabularies, it takes continued coaching to make them retain the use of their first two or three ardently learned words.

There is no doubt that the muscular patterns of forming words are difficult, but it hardly seems likely that this would be such a check to a chimpanzee who could find any facility and need in the use of words. It is this last, the use proper, which seems to be too taxing. It seems strange in view of their ready conveyance of simple notions by other means; but it may be just this, that using words is a harder way of doing what they already do more easily by other means. We seem in any event to be up against a chimpanzee's limits; up against his refusal to use these unnatural and conventionalized signals (words) such as might carry over and become mental symbols, as we use them.

All this looking up at language from the animal plane emphasizes its nature as a structure of abstractions and symbols and the fact that it is essentially like the rest of culture. Indeed, in trying to analyze and define culture scientifically, you cannot find a better illustration than language. It has all the main characteristics of culture and shows them more clearly than any other aspect. It certainly consists of patterns of agreed-on behavior, which is what I have used to define culture. It would not exist without society; nobody ever had a language all his own, which could only be a code, not a language. It is inherited by a society not by individuals; it is non-biological. And it differs from group to group, although it does the same things for all. Just as there is no one culture, but a lot of them, so there is no one language but a lot of them. Finally, a language can and does change, much more quickly than any biological evolution, and by different rates.

*The sounds, the grammar
and the sense*

To the unthinking it has been easy to suppose that there was indeed something inherited about a person's speech, because all humans say "Ugh," and because it is so much easier for Frenchmen to speak French than for English or Americans to do so. The first notion, of course, is nonsense. As to the second, we simply do not give ourselves enough credit for what we have learned in pronouncing our native tongue. We speak, not with things which were put in our mouths to speak with, but with our teeth, which are for grinding up food, and our tongue and lips, which are for shoving it around during the grinding. The wonder is with all the energetic palaver, that the latter do not get bitten by the former more often than they do. A little contemplation of the hazards should do more to stop you from talking with your mouth full than all the lectures Mother ever gave you.

Now this whole curious engine can make literally hundreds of distinct sounds. That is far more than any one language could possibly use, if the language is going to have any kind of consistency itself. In fact, something in the neighborhood of thirty or forty sounds, a minute fraction, is what most languages make out with, and it is with those particular sounds of your own language that you become exceedingly adept, while you never practice the hundreds of other possible ones. But another language

—say French—is now using a different set of sounds, and little French children have been practicing all day every day with a bunch of rather squashed-down vowels, while neglecting to study the "th" sound which serves us ~~us~~ through thick and thin. No wonder one would think their mouths were actually shaped differently.

But sounds are the least of the differences between languages. The words may have no likenesses at all: the same abstraction may be represented by an infinity of different symbols, which emphasizes the symbolic and cultural nature of language. Grammar has more limits: any language has to have a kind of order.

ing and grouping of its words, since some words have to refer to things, some to actions, some to qualities, and so on. But grammars have an astonishing diversity as well. You have probably studied Latin, at least enough to know that the different forms of a word—which make up its inflections: *amo, amas, amat*—have a lot to do with its meaning. If you have, you are probably extra happy to speak English, which is greatly simplified in this respect, and from which inflections have nearly disappeared. We can still tell the nature of many words from their forms, particularly endings (“-ed,” “-ing,” “-ly”), but on the whole we have to a very great extent given up changing the form of a word because of its sense. However, in Greek, Latin, French, German, Russian and so on, the verbs are energetically conjugated according to person, tense and mood, so that if you say “*ich verschnipfle*,” it means that the *verschnipfeling* is being done in the first person singular, present indicative. You have to change the word itself to fit other situations, so that it has about forty different forms that you must know and use.

We have jettisoned practically all of this in English. Skipping the present participle and the verb “I am,” we have four different forms of the word in some of our remaining strong verbs—“I write, he writes, I wrote, I have written”—three in most: “I look, he looks, I looked, I have looked”; and two only in many: “I hit, he hits, I hit, I have hit.” (It is estimated, from past rates of change, that in less than a thousand years, and without any help from World War III, all English verbs will have the typical form: “I write, I writed, I have writed.” Which do you say: “I dreamt” or “I dreamed”?) The “s” of the third person singular present is a vestige, and quite unnecessary: we say “he fights” but not “he foughts,” and we do not say “he cans” or “he musts.”

English has become strongly isolating, throwing separate items of sense onto separate words, such as person involved (*I*), tense (*have*), mood (*should*), and depending on auxiliaries. All this is a blessing for children in school and other reluctant grammarians, but it puts an extra burden on syntax, or the proper arrangement of words, and on the sense of what is being said

as a whole. If, for example, I speak the lone word "flee," without spelling it, you are baffled. You do not know whether it refers to a flight or a bite; you do not know whether it is a verb or a noun, whether it is subject or object, masculine, feminine or neuter. But you probably do not care; at any rate, the English grammar does not.

English is not unique in this general way; Chinese and others are also isolating. But if English is uninflected compared to Latin, there are languages in the southwest Pacific which make Latin look poor indeed. Some of the natives of Australia, or of New Guinea, have verb tenses—not just past tenses, but a tense for a little while ago and a tense for a long while ago, a tense for pretty soon and a tense for not for a while yet; such variations of tense, mood and so forth may run over seventy, with infinitives, presents, imperfects, present habituels, perfectives, indefinites, subjunctives, progressives, etc., etc. They have not just singular and plural numbers, but singular (I), dual (we, two of us), trial (we, three of us) and plural (we, all of us). And they may incorporate in the verb not only the subject, like Latin (*amo*, I love), but also the object so that, all in all, it is possible to produce a battleship of a verb meaning "you three men killed her." This is fancy inflection, and different from agglutination, another tendency which is also foreign to English: the agglutinating Eskimos, for example, simply paste up most of a sentence into a single word.

English no longer has genders. In Latin or German, nouns are masculine, feminine or neuter, and adjectives have to agree with them. In English, nouns do not fall into such classes. French has distinct forms for masculine and feminine (e.g., *le lion*, *la lionne*), but it is not fair to say that our similar distinctions are grammatical forms. "Lioness" is simply a specific word for female lion, or "actress" for female actor, just as "mare" is a specific word for female horse, the distinction getting no recognition from the rest of the language, like the French *le* or *la* for "the." But in African Bantu languages there are a number of genders, or classes of nouns, with most of the words in the sentence taking their cue

from the noun; and the same usage becomes outrageous on Bougainville, in the Solomons, where a language may have no less than twenty genders to keep straight. In this same misguided part of the world (Australia again) there are native tongues that even conjugate adverbs as if they were verbs. Be thankful reader, that this book is written in English.

4

Histories and changes

So languages have a wide choice of grammatical tricks, as they have of sounds. And, as is also true of their sounds, their grammars are clear-cut, and rule the language with an iron hand. I think I have shown that they can be complicated, and that English has a simple one. English has every reason to be unusual among its relatives, for it has undergone an extraordinary man-handling during its history. Starting as a Germanic tongue, it was imported to Britain before 500 A.D. by the Anglo-Saxons and thrust upon the Keltic-speaking natives (not all of whom have accepted it yet), who had already become literate at the hands of the Romans, and were able to write it as time went on. The Danes in their turn arrived and tried to speak it, for they gave us some of our common words. Old English was now a literary language and its inflections were starting to go. Then it suffered the onslaught of the conquering Normans and practically went underground. Nobody wrote it any more, because French was spoken and written by anyone who mattered.

But English won out, bedecked with a vast number of French words, and with its onetime grammatical structure in advanced decay, so that by Shakespeare's time its vocabulary was enormous and gaudy and its grammar what we use today. Even so, changes have gone steadily on. "Thou" has departed, and the question inversion "Have you?" is just now going the way of "Think you?" driven hard by the gum-chewing ninety-day wonder "Do you have?" Perhaps this last has a sort of precedent in the English quaintness, "I do be the gardener." Perhaps it got an assist from

the other use of "have": "Do you *haft* to make that noise?" But it is certain that "Do you have a match?" is victorious; perhaps we may start scanning the horizon for signs of "Do you can spare a dime?"

These fresh mouths taking up English have doubtless been important, pulling and hauling at it, pidginizing it, making it glib and streamlined, particularly when there was a great body of such new mouths, who could take it and use it among themselves. (My own recipe for speaking foreign languages is to take the present tense and stick to it, but the effect on those languages so far has been slight.) Perhaps the latest such body was the slaves from Africa, stripped of their own different tribal languages by being mixed up, and given no formal instruction in the new one. At any rate, one can see signs of still further English simplification in Negro areas of the New World, for example in calypsos. And at a Southern shoot I have heard a Negro helper ask, "That lady, where she gun?"—a triumph of isolationism, since it refuses the chances of "inflection" offered by each "s" in the normal "Where's that lady's gun?" A preview of future English? In any event, when you look at the exposed position of the "s" in "he says," and realize how often in this country you can hear "he say," you can make out a pretty good defense even for "he don't" or "ain't."

The above doodling should show that English, like any language in fact, is always in a fluid state, which is true of culture in general. English has gone through some particularly striking changes, and we happen to know a good deal about its past. But even if we did not have the written evidence, we could still make out much of what had happened, and where English came from, by studying its structure and rules, and noting that while it obviously had received a terrific infusion from French, particularly of more fancy words, its bedrock vocabulary of names for everyday things is Germanic in nature.

The same sort of thing can be done with any language, written or not, and the more easily if its grammar has not had all the vaguenesses of English. Languages are continually drifting, so

that Latin, settling in different places, became French, Spanish, Italian, Rumanian. But languages—all languages—change neatly and consistently as they change. They drift, but they also have a powerful tendency always to regularize themselves. This is especially true of sounds. You do not find that one sound has changed in one word; instead, that sound will have made the same change in all words using it, and certain other sounds which are linked to it in the way the mouth forms them will very likely have made a similar shift.

So whole lists of differing words will be found to differ simply because the people have made a slight cultural change in where they put their tongues or use their breath in pronunciation. German *Teufel* is English "devil," *Taube* is "dove," and all "t's" of the same type are replaced in English by "d's," while the "d's" in turn are replaced by "th's" (*Donner*, "thunder"). This is a general phenomenon; for a single non-European example, Samoan "t" becomes Hawaiian "k," along with other shifts.

In this way it is possible to find true likenesses and put languages into families. If the changes have been slight, they are closely related—have not long been separate. If the differences are very great, so that vocabularies cannot be matched at all, it may be that some general rules of grammar, of ways of classifying and using their words, show a distant, almost lost kinship. This is where doubt comes in. The great Indo-European group, to which English belongs, hangs together easily, since plenty of words can be traced throughout its members, including Sanskrit, one of its oldest, fully fledged forms. But that is as far as one can go; there are only the dimmest hints as to how this massive family might be related to some of the other languages of the Old World, such as Ural-Altaic, if at all. At the other end of the scale, the speech of the Basques in the Pyrenees stands entirely by itself, still not linked to anything else, an orphan remnant of the unknown languages of the time before Indo-European spread out of the East to blanket western Europe. More of an intermediate situation exists among the Indians of the New World. Here are some widespread families, like Algonquian or the homogeneous

Eskimo, together with a large number of isolated minor stocks or single languages which offer some vague possible interrelationships to keep the scholars arguing.

Now this should not offer the hope that, if only there were better records, or if more subtle ways of recognizing relationships could be found, it would be possible finally to tie all languages together and arrive at last at a reconstruction of the original language of man. Undoubtedly better ways of analysis will carry the family lines further back and, in cases, closer together. But the fact remains that languages change, and change so quickly that to go all the way back would be like trying to save a ship's wake. Indo-European is estimated to have first come into being about six thousand years ago only, and language is many, many times older than that. Languages, families and patterns probably formed and re-formed several times over before the period when there existed anything which could be recognized by direct comparison as a parent of a living language.

That, at any rate, is what I should read in the demonstrated changes and the great diversity which have been found in the tongues of our own time. I think this even though some other aspects of culture, like tools, are known to have been more sluggish; language is not bound by a hunk of flint but, like supernatural beliefs, may twist and slip from one generation to another, quite without allowing the speakers to be aware. And, in any case, all we shall ever know about languages is limited to the kind of men who inhabit the world today.

Here we have one more interesting and not-to-be-forgotten thing about languages. We know that some of the people who have survived are "savages," having a simple culture and leading a primitive life, and seeming as though they might themselves be primitive men, living fossils. But a careful study of physique shows that we are all the same kind of man, *Homo sapiens*. And language shows rather well that we all have the same kind of capacity for culture, since we all use language in about the same way. You cannot go hopefully to the poor Bushman, to find him speaking something more rudimentary than yourself, which will

point back toward the early days of languages. There are no primitive languages now. Languages of people in primitive cultures may be complicated in form or not, but the average is more complicated than English and they are all equally rigid in their obedience to grammar, and all able to express what is demanded of them, concrete or abstract. They may not have words, of course, for things which do not exist in their cultures. Our inventors have swelled our dictionary enormously. But, at the same time, Eskimo has twenty or more precise words for conditions of snow; and the Tokelau Islanders, in northwest Polynesia, have nine names for distinct stages of ripeness in a coconut, their main food. In any case, the number of words is not a real character of the language itself.

There must have been a time when language was different, more limited or simpler, just as we know there was a time when men had smaller brains. We cannot dig up languages like skeletons, and we can never do anything but guess about beginnings. It seems only logical that very primitive men—hominids of the man-ape variety—made a good deal of constant expressive noise, just as chimpanzees do, and that, little by little, more symbolic content entered into this noise as the animals making it became mentally more capable of symbolizing. We cannot tell when this happened. We do not know what kind of brain would have been necessary, and so we cannot look at a fossil skull and say, "He talked." (Obviously the jaw will not tell us.)

But true speech must have put in its appearance along with the earliest signs of culture in general, because language and culture are so much the same thing. In fact, since culture is a social thing, and since language is necessary to transmit anything in the least abstract, it is hard to see how culture could have gone beyond the rawest imitation and standardizing of simple actions—the very next stage above the chimps—with language marching by its side.

5 Early tools: the Lower Paleolithic

We stand no chance of finding out anything about early language. We are not going to know much more about the earliest rudiments of the rest of culture. But there is this difference: the economic or material side of culture does leave actual objects behind, and so we can begin to study its history with these.

It will be only a fragmentary history at best, as common sense will tell you. Imagine yourself as a toothy, not too clever hominid, bent on becoming human. You are a more natural tool-user than is a chimpanzee; your hands are better proportioned, with shorter fingers, and freer and more nimble. Furthermore, your arms are less strong and your canine teeth do not protrude, so that a little something held in the hand will be a distinct help in attacking squirrel or beast or in opening the tough rind of a wild fruit.

The things you would use, back there in the Pliocene, would be more or less random to begin with: a stick for this and a stone for that. But you and your descendants might begin to keep a stick which seemed to have just the right heft, instead of dropping it after getting it after it had been used. Finally your ten thousandth great-grandson not only might be trimming a new stick with a sharp rock to make it do, but also might be appreciating the way it fits in and uses so clearly that he and his fellows were the same thing repeatedly.

This would not accord with the notion of Ug the Cave Man killing a bear on the head with a stick for the first time and astonished at his cleverness, rushing around to apprise all the men of what can be done with clubs. On the contrary,

the process of the adoption of culture among very early "men" must have been gradual in the extreme, and devoid of such purpose forward, or yet of any clear awareness of the benefits being gathered, even though these benefits were a great spur to the continuing of the process itself. I have pictured the beginning of language as natural chatter gradually taking on meaning. It is fair to think of culture as implements used (as apes sometimes use them) gradually taking on fuller meaning to the user, and with this meaning, taking on pattern, at which point something exists which can belong to a group of people. Apes have been seen to trim branches by pulling off twigs, and to bite sticks to point them, but always in meeting a special problem, and not to fit a pre-existing pattern.

But to return to you in your most ancient days. What sort of things would you find useful? Pieces of wood, or of antler and bone; sharp stones for cutting, and also shells; thorns, animals' claws and the like; doubtless twine, from vines or sinews or hide. Pride of purpose would not compel you to make a neat or fancy job of your utensils if something good enough was at hand, like a natural horn point, or a coconut shell cup. What I am getting at is this: there must have been a good deal of simple culture, in the sense of behavior patterns of use, before anything was made so complicated as to be strikingly distinct from natural objects in its shape. So, even if we should find such very early utensils—and most would be perishable—we would not necessarily be able to recognize them. Primitive people today, along with their best tools, also use things straight out of nature when it suits them: clamshells to cut hair, stones for throwing or for slings, and so forth.

This means that the period of culture^o beginnings is a shadowy one, and certainly a long one, about which we can know nothing and can only speculate as we have done, which is not much. Perhaps the first objects of culture were bone clubs used by the South African man-apes. At least Dr. Dart, their discoverer, thinks so. These fossils came from what were once caves, since filled with wind-blown dust and sand and fallen fragments from the roof.

coated together by lime-bearing ground water, and often call for blasting to be dislodged. After a blast, fossil-bearing rocks fall down on every hand, mostly containing the remains of animals other than the rare man-apes; and among these other animals have been found a number of baboons, which are not cave dwellers by nature. They are represented largely by skulls, separate from their skeletons; and the skulls, Dr. Dart finds, have almost all been broken by blows from a blunt instrument.

The fractures were made when the bone was fresh—living—and not by falling roof fragments, or by crushing during the slow process of fossilization. Some skulls were opened, it appears, to get at the brain, others simply bear the marks of crushing blows. Some of them have peculiar paired dents. Now nothing, Dr. Dart claims, could have caused all these wounds except intentional blows, from above, with a club, and nobody, it seems clear, was present to deliver the blows except the man-apes. Dr. Dart has found, he believes, the clubs themselves. They consist of several specimens of the lower part of the humerus (elbow and upper forearm) of large ruminants such as the blue wildebeest, having a little less than the size and weight of the lower end of our own thighbone. These specimens, when fresh, would have made excellent light clubs; they are excessively scarred and chipped along the two sharp ridges which characterize the elbow end, and these ridges themselves are a suspiciously good match for some of the paired depressed fractures in the baboon skulls.

Perhaps the damage was actually done by hyenas, and it would be very hard definitely to prove that Dr. Dart is right, but in the circumstances he has made out a good case. And if the man-apes really had the custom of searching out the right bone from a wildebeest carcass and then breaking off part of it with every intent of using the rest of it to destroy baboons (i.e., not simply in a prompt performance like Samson and his jawbone), then there is no escaping the conclusion: they had culture.

That is not really hard to accept. Their brains, as we shall see, were not much larger than those of apes, but not much smaller than that of the Java Man. Their hominid physical form would

urge them to use tools. Furthermore, as Professor Hallowell says,¹ the capacity for culture rests not on brain size alone but also on a more advanced personality structure related to this, and the difference in brain volume between chimps and man-apes might not fully reflect the associated personality differences. But this is a complicated point.

A matter of interest equal to the signs of culture is the evidence that the man-apes were meat-eaters like ourselves, while our living forest apes are almost entirely vegetarian (though they readily eat meat in captivity). The evidence for meat-eating is the same, of course: the manglefi baboons. But again the probabilities support it. South Africa did not differ essentially in its climate or animal types from the present-day veldt and its inhabitants, and the abundant fruits, buds, pods and so on of the forest were not available. Furthermore, the teeth of the man-apes were like ours in form, apparently adapted for a very broad diet, and less specifically for coarse vegetable foods, like those of the anthropoid apes.

Whether or not these wildebeest bones are really the simplest known relics of "human" endeavor, the fact of their being preserved at all is most extraordinary. Being bone, they had to be fossilized—have their perishable matter replaced by mineral salts—and such excellent conditions for this are rare; furthermore, they had to be found together with the broken baboon skulls which give them meaning, since they could hardly be convincing as tools all by themselves. All the other earliest tools of man have enough signs of working to show that they were made on purpose, and all, with one or two possible exceptions—are of stone, which is imperishable in its own right. They are the signs of culture which begin in the Stone Age proper, the Paleolithic.

A. Irving Hallowell, "Personality structure and the evolution of man," *American Anthropologist*, LII (1950) 159–73.

The Pleistocene backdrop

These stone implements are actually as old as the man-apes, or some of them, as far as can be told. They were probably made by a mere advanced kind of man, already in existence. In any case, it is hard to be definite about the age of the man-apes. Their fossils have come from five different spots, and at each of these the baboons were of different types or species. However, the baboons and the other animal remains, and the actual stuff of the deposits themselves, all suggest that the deposits form a sequence, from the end of one damp phase (Kageran) to the beginning of the next (Kamasian), these being close to the start of what was elsewhere the Ice Age. But here in South Africa the Ice Age had no drastic effects. The climate, and all that goes with it in the way of animal life, has changed little, and gradually, in the recent past, so there is not much to mark off phases and to make time relations clear.

Not so to the north, or in most of the world's land. Here the onset of the Ice Age, the Pleistocene, about a million years ago, was marked by the spreading of vast sheets of ice out of the highlands and down from the north latitudes in the first great glaciation. The cause of this epoch of drastic climate changes has never been fully decided, but the preferred theory is that slight fluctuations in the heat arriving from the sun had an intensified effect in new highlands and mountain chains which had been thrusting up higher in the late Tertiary, such as the Rockies, the Alps, the Himalayas and others. These higher altitudes were cold zones, and they also caused moisture-bearing winds to drop great quantities of snow on them. With a small drop in the average heat of the sun, the glaciers grew and crept out over lower lands, chilling whole continents before them. Then the process was reversed, and the ice shrank and vanished, and temperatures rose above those of today.

This happened four times, and the four glaciations also had

substages or fluctuations of intensity. It was not exactly like a tide rising and falling; it was more like a tide which paused, hesitated, fell back a little, became high again, went on certainly, and remained out longer than would be expected at all, especially on the second retreat, the second interglacial.

Now, naturally, as the glaciers spread, they pushed the zones of temperature and climate far in front of them. Near the ice there was barren ground and tundra, like the present day Far North of Canada and Siberia. Then came spruce and birch forest, then temperate forests or grasslands. These were displaced further south in the glacial phases, and rain was heavier in those areas where snow did not fall. As the zones of climate moved on, so the animals which depended on them move also. At the beginning of the Pleistocene a large number of new genera and species of animals made their evolutionary appearance, particularly in the horses, elephants, camels and cattle, as distinguished from their parental forms. These and all the rest were swept back and forth by the changing climate, so that fossil elephants and horses turn up in England, or walrus in Georgia and musk oxen in Alaska.

As the Ice Age progressed, many of these species, and others, died off, so that each stage has left deposits with different groups of animals in them. This fact, and what is known about the way successive ice sheets caused the laying down of sand and gravel in river valleys, or the shifting up and down of sea-shores and lake shores, tells us much about the probable ages of stone tools which are discovered in the same deposit. The animals in particular fall into three broad divisions: Lower Pleistocene (the first glacial and interglacial phases), Middle Pleistocene (the second glacial and interglacial phases), and Upper Pleistocene (the third and fourth glacial phases and the interglacial). Unfortunately, the putting together of these facts, especially from different parts of the world, is much more complicated than it may sound, and there is much uncertainty about placing some of the human remains in their proper place of the Ice Age.

Simple tools, slow change

~~Now as to the stonework.~~ The earliest goes right to the beginning of the Pleistocene, and may actually precede the first glacial period. It consists of extremely crude cutting tools, made by knocking a roughly spherical pebble so as to get a sharp edge, such as were found in North Africa. Slightly later, somewhat improved pebble tools were being made in East Africa (the Kafuan culture) and in South Africa (the Stellenbosch culture).



A pebble tool from the earliest Pleistocene

Following these, perhaps equally old but at least first intermediate in kind of tool appears in Europe and throughout Africa the Acheulian hand-axe. Imagine an old-fashioned pendant or brooch of amethyst or topaz, pear-shaped and slightly flattened, but that it has a detectable edge running around its outer curve. The facets of this being very crude and irregular, and the whole about seven inches long from fat end to thin end, and you have a hand-axe. This name is an old fashioned one, and it certainly does not mean that its use is known, or that it was held in the hand. It certainly does not mean that the men who made them had strong hands, such as would have been needed



An Abbevillian hand-axe

to use it as a one-hand weapon, because we are sure they did not. It is too heavy to have been swung like a true axe, with a handle. It may have been used in both hands to grub up wild roots and vegetables; it might have served to open fruit rinds or coconuts, taking up work which our ancestors' unobtrusive canine teeth refused; we do not know. Someday a much better knowledge of the environment in which they were made may tell us. They seem to be connected with warm weather and warm climates, but this is hardly strange; primitive men of this period probably kept well away from glaciers.

At the same time very crude flakes of flint were in use for cutting or scraping, undoubtedly accompanied also by other stone implements of forms so vague as to make the archaeologists argue, or too casual to be recognized at all. These tools were

shaped in the simplest possible ways, principally by striking the object rock with another or, in the case of the hand-axe, getting a slightly more controlled flaking process by holding the tool in both hands and bringing it down on another rock serving as an anvil, and striking off good-sized chips in this way. This is how you today, with all your intellect, might begin to do such work yourself, but I think you would not practice for many years before better methods would occur to you. Such improvements, however, took place then and for long after with tantalizing slowness, over hundreds of thousands of years.

After the second glacial phase had come and gone the hand-axes of Europe and Africa did manifest a somewhat advanced form, known as the Acheulean industry. They were flatter, lighter, more oval generally and more neatly worked, with straighter and more efficient edges, the result of their being shaped with a wooden striker. This, being more resilient, produces lighter and



An Acheulean hand-axe

more even chips than does the coarse, untrustworthy battering of a stone hammer. The common type of flake tool in Europe, known as Clactonian (from Clacton-on-Sea, England), remained crude.

Now for the first time there appeared stone tools in the Far East, in China, Burma, Malaya and Java. The most ancient tool from China is a pebble tool, and the general type of implement from the whole Far East is related to this, being a fair-sized chopper having one edge flaked along one side and constituting



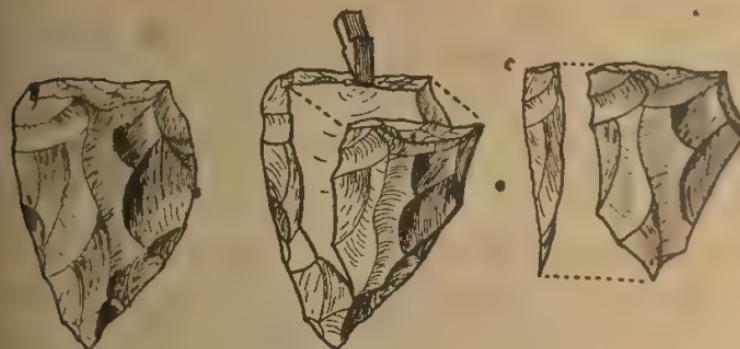
A chopping tool from the Pekin cave

something quite distinct from the two-faced hand-axe of the West. There were some local variations on this, owing in part to the kind of stone used (in Burma the choppers or cleavers were made of petrified wood). There were also some flake tools. But the whole area stands independent of the West, with a boundary in India. Furthermore, it seems to have taken a late start, and to have lagged behind in developments, as did South Africa from this time on.

New ideas in flaking

Toward the end of this period, the Middle Pleistocene, still another advance took place in the method of making flakes, the Levalloisian technique. A flake tool, unlike a pebble tool or a hand-axe, is made from a flat flake which has itself been struck off from a core. The Levalloisian technique made the shape of this surer by advance preparation: first the core piece was flaked

to a turtle-shell shape, and then a flat place made, as if you had chopped off the turtle's head and chopped off some of the shell in doing so. Then a careful blow against this special platform neatly takes off the crown of the turtle's shell, giving you a well-formed



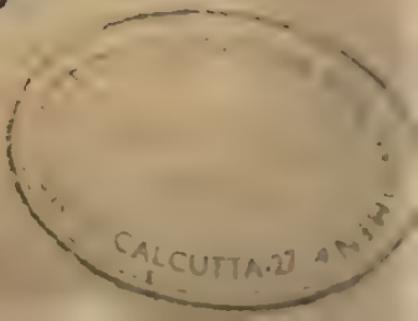
The making of a Levallois flake

flake, smooth on one side and pre-flaked on the other. It is practically a prefabricated spear point, or knife, or scraper, as you wish. In this method the basic form of a tool had been brought under a considerable degree of control, and for that reason it was an idea important for the future of stoneworking.

Still later, similar flakes for tools were made in another fashion by the Mousterians. A core of the same general kind was used, but the flakes were made directly, by striking from the edge toward the dome, and taken for use instead of being discarded as a mere step in preparing the dome for the striking off of a flake



A Mousterian point



of the Levalloisian type. And, as another new technique, the edges of the flakes were trimmed around by knocking off small secondary chips.

This brings us into the last and highest phase of the long Lower Paleolithic period of human culture, in the third interglacial and the early part of the last glacial. Over more than half a million years stone tools had lost much of their early crudity and had shapes which were both definite and efficient, though nothing as fine as an American Indian arrowhead had ever yet been made. The Levalloisian technique prevailed widely. So also did the Acheulean tradition, now producing relatively small hand-axes of a more special nature. Along with these there existed the newer industry, the Mousterian, related somewhat to both of them, and possibly also to the older simple flake industry, now marked by good secondary flaking. In western Europe the Mousterian was identified with the last of the Neanderthal men. Thus all of these traditions of flintworking had come together to a degree, producing medium to small tools and giving rise to certain distinctions in different areas. But the main techniques or styles were still spread over enormous areas, covering Europe and most of Africa, and extending into the Near East, central Asia and India. The Far East stuck to its ancient choppers, however, and neither the hand-axe nor the Levalloisian flake technique ever appeared there.

So, from the beginning right up to the end of the Lower Paleolithic, practically all we know about culture is stonework; at least this is all that can be studied systematically. It is a rather surprising thing that bone or antler does not seem to have been used to any degree. It might have decayed entirely in all the oldest deposits, but this is not the complete answer, because it would have survived in the Pekin caves dating from the second interglacial, since unworked antler and bone is there in profusion. (Some of this was used by man but it is doubtful whether any of it was shaped intentionally.) Also the Mousterian people used bone anvils for their stoneworking, and a few crude split-bone skinning tools, and that seems to be all.

The rest of what we can tell is made up of random bits of information and guesses. At first man's culture did not separate him very far from nature. His economy was not really different from that of the apes: he gathered the goods of nature to eat, and spent his time at this. Probably, however, his gathering included meat, at least as far back as the man-ape stage, and not vegetable matter only. A little further along we can make out his actual bill of fare somewhat, in such a place as the Pekin caves where quantities of animal bones are found along with berry seeds. Something more important is found too: charcoal. So we know that the Pekin men, in the second interglacial, were already using fire, and cooking is a great aid to digestion. This is culture with a vengeance.

These people probably used caves for shelter only casually, like the man-apes. Whether they dressed themselves we do not know. But life probably had become this formal much later on, among the Mousterians, because they lived close to the glacier, and because their implements suggest skin-working. Other touches of formality appear. The Mousterians were without art, but they must have had religious ideas. In Swiss caves they left what look like shrines made up of the skulls of bears they had killed. And they buried their dead, which the Pekin men did not do. The Pekin men had, alas, different ideas of sepulture; they ate each other, cracking open shinbones and skulls, and strewing the grisly remnants around the cave, to be found in our own century. In this they were apparently like the man-apes, some of whose skulls seem to have the same kinds of wounds from a bone billy as did the skulls of baboons they used for food.

Whatever we may find out, or not find out, about culture in this long dawn phase, the striking thing is the pitiable slowness with which it changed and went forward. In this chapter, describing the Lower Paleolithic, I have covered very nearly all the Ice Age. And the clumsiness of the most ancient tools, persisting so long after the benefit of tools must have already strongly affected human life, is surprising. But perhaps after you have seen the men of the time you will be less confounded.

6 *Early men*

We have a far broader view of the tools of the Lower Paleolithic than we have of the men who were making them. Early human fossils are all too scarce, and we still have a lot of puzzles on our hands as to just how humanity was developing in the Pleistocene, even as to who our own proper ancestors were.

We know, of course, something about the australopithecine stage. These step-ancestors, or whatever kind of relative they may finally turn out to be, were on the whole somewhat smaller than we. We have seen that they were erect walkers: the pelvis shows it, and such other morsels of the skeleton as have been found agree with this, as far as they say anything. As we have also seen, the skull shows that it was hinged to the spine in a generally upright position, and the brain was placed higher than in an ape, with the face farther down in front.

But they looked ape-headed all the same. The jaws were large and deep, if not greatly jutting forward, even in the smaller types; and in the largest the lower jaw was astonishingly broad at the corners, with big molar teeth. Thus the jaws were ape-size but not ape-shape, being wide behind but not long, and not having the broad and protruding front teeth of a gorilla or a chimpanzee. The brains were also ape-size, but not entirely: they measure from around the gorilla maximum of about 500–600 cubic centimeters up to possibly 850 cubic centimeters, if careful estimates based on some of the damaged specimens are to be relied on. That is a significant increase beyond any ape, and is something of a start toward the figure of about 1450 for the average American male of today.

The australopith fossils have all been found in one corner of Africa. But similar remains have already turned up elsewhere. One such fragment is known from well to the north, in East Africa. Others come from a Hong Kong drugstore. Chinese drug-gists—you can find them in Chinatown—sell fossils (dragon bones) to be ground up and taken for medicine. Dr. von Koenigswald, a Dutch paleontologist, knows this and is one of their best customers, not because of tummy-ache but because it lets him inspect vast numbers of fossil teeth, brought out of the Chinese hinterland, for signs of new species. He has bought in Hong Kong at least three teeth which must have belonged to a creature near-human like the man-apes. These molar teeth share the ape-and-man, or hominoid, main pattern, and have the high crowns and blunt cusps of the hominid, or human, side of the stock. He named the unknown possessor of the teeth *Gigantopithecus*, because they are the largest primate teeth ever seen.

Smaller by far, but still bigger than anything else except the australopiths, is a piece of lower jaw with a few back teeth, found by this same Dr. von Koenigswald in Java, and believed to belong to the first interglacial (possibly second glacial) of the Pleistocene. The fragment is massive and ultra-gorilla in its proportions, but it has the bluntness, and roundness in front, of the australopith-human jaws, as well as their kind of teeth. It is probably another Far Eastern kind of man-ape, or perhaps a type a little more advanced in our direction. It is known as *Meganthropus*. Like the *Gigantopithecus* teeth, its size was startling when it was found in 1941. It has given rise to talk of a "nine-foot Java giant"; this giant lives in the newspaper files, and almost as often as a new human or australopith fossil is found, the giant is taken out by the editors and blown up again like a beach toy for purposes of comparison and sensation.

These two, *Meganthropus* and *Gigantopithecus*, also caused Dr. Weidenreich to hold that the whole human stock had passed through a giant stage in its early existence. But another look at the man-apes (especially those most lately discovered) reminds us that, in the primitive hominid line, great jaws on little people

grow, or at least on bodies of no more than ordinary size. Actually the known fossils seem to say that man is about as big as he ever was, and has had much the same size all through the Pleistocene.

In fact the man-ape skeletons—what is known of them—possess only a limited degree of difference from our own: the hipbones show certain distinctions in detail. They had attained, as I have said, the essentially human thing, erectness. After this stage a little polishing up took place, the skeleton in our other human fossils became what it is today, and beyond this point human evolution affected only the head, a process of enlarging the brain and diminishing the teeth. Other changes were related to this, such as a shrinking of the face, a thinning of the top of the skull, and a perfection of the balancing of the head on the spine.

Ancient man in the Far East

We can proceed to the Java Man (*Pithecanthropus*), who had little enough to offer in this kind of progress. His thighbone is perfectly modern, and of modern size, leading us to suppose that the same may be said of the rest of his skeleton when it comes to light. But his head was a brutal affair. It represents a distinct step up from the australopiths: like them, the region of the mouth is protruding because of a large jaw and teeth (in an ape the whole face is simply one long slant), but the jaw and the protrusion are relatively less. And he had a slightly larger brain, though so slightly that we can make little of it: males probably had a brain volume of about 900 cubic centimeters. The whole appearance of his skull is unmistakably more human, to use the word charitably, than that of a man-ape. And yet some features of it seem actually to be more primitive. The brain case is low and entirely without a forehead, and exceedingly thick—more so than that of any man, ape or australopith—another circumstance which made Dr. Weidenreich think of the ancestral human being as a giant. His front teeth were relatively large and spread out, and there was a

gap in the upper tooth row at the corner, to receive the tip of the lower canine tooth. This is an apelike trait not seen in any other human or australopith fossil, which emphasizes the broadened, rather apelike nature of the front of the mouth.

The remains of the Java men consist of several leg bones, major parts of five skulls (one a baby), and various odd teeth and other fragments. They came from riverbanks at different places in cen-



Skulls of the Java, Pekin and Solo men

tral Java, and are believed to belong to levels corresponding to the first interglacial and second glacial phases, or possibly two periods of the second glacial; at any rate a respectable period of time. Notice that Java Man may therefore have been living in the same place and at the same time as the more primitive *Meganthropus*. It is possible that the later specimens of Java Man were themselves slightly less primitive than the earliest ones, but this is not definite. No signs of culture have yet been recognized in the same deposits as the bones, but the crudest choppers in Java do belong in the very next phase, the second interglacial, and we may judge that they were probably made by the immediate descendants of the men whose bones we have.

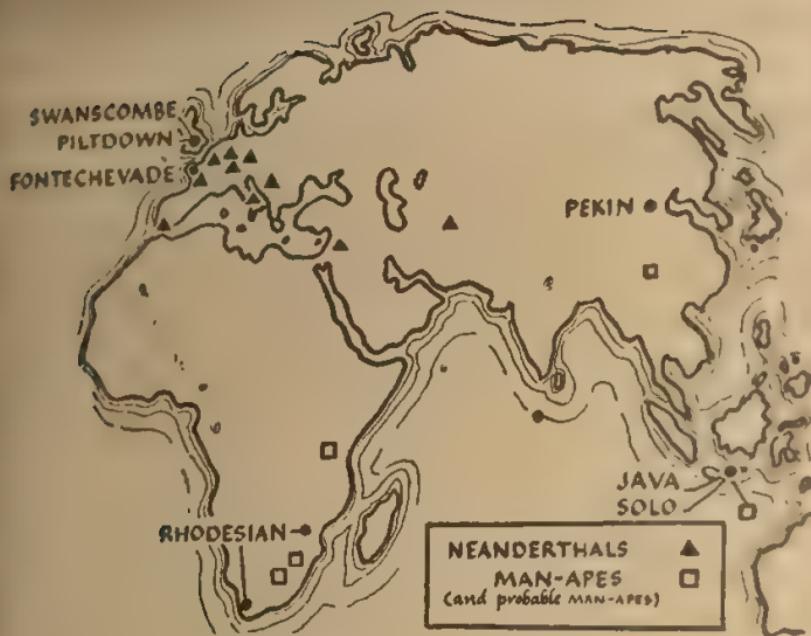
The men of the Pekin caves (*Sinanthropus*) lived just after the known Java men, during the late second interglacial. There is no question about their tools, found in a large filled cave along with their own bones: they are one form of the same general Far Eastern chopper type. The human bones were fairly plentiful, as such things go, and pieces, large or small, were recovered of about

forty different individuals. A few fragments of thighbones assure us that they were entirely modern in shape, as in the case of Java Man, though a little heavy in construction.

As to the skull, a look at it reveals at once that it is basically like Java Man's. It is simply an improved version. The bony brows are just as massive. The outline is much like the Javanese form. But the brain volume of males was something not far from 1150 cubic centimeters, or about what an unusually small normal brain of today might be. The skull itself was thinner with signs of a less massive set of neck muscles to hold it up at the back, and it had in outline a distinct if modest angle at the front, the merest suggestion of a forehead. The face has a general resemblance to Java Man's, but the whole mouth has receded and become smaller. The smaller teeth make a more human arch, and the shorter jaw is not so sloping at the front. It has no real chin, to be sure, but it has at least an angle where a chin ought to be, and is not so arrogantly retreating as is the Javanese jaw. Pekin Man had about as much of a chin as he had of a forehead, and this was very little of either.

The family likeness of the Java and Pekin men is evident. What may have been another member of this family lived, also in Java, at a later time, during the third interglacial or perhaps the fourth and last glacial, at any rate in the latter part of the time of the Lower Paleolithic. He is the Solo Man, so named because he was found, under dismaying circumstances, at Ngandong on the Solo River, only a few miles from Trinil, also on the Solo, where the first specimen of Java Man was discovered. A remnant of an older bank of the river yielded two shinbones and eleven skulls, and nothing else; furthermore, the skulls lacked every vestige of face and jaw—not a tooth was found—and all had their bases broken in, most of them being found lying upside down in the gravel. Another case of cannibalism seems indicated. Such specimens of stonework as were recovered from the deposit seem to have disappeared during the wartime Japanese occupation of Java.

Once more, the leg bones are modern, though robust. The skulls are also robust, remarkably so, and larger in every way than the



Where fossil men have been found

older Java Man's; the brain, however, was not as large as the appearance of the skulls suggests, and was only a little larger than those of the Pekin men. These crania, like the others I have described, are graced with heavy bars of bone across the brows, with fleeting and nearly absent foreheads, and with ridged roofs. At the back, however, there are some signs that the head was better poised on the spine. On the whole, the Solo skulls look like a later and expanded version of the Java Man, without being the same form as the Pekin skulls. This is, in fact, just what Dr. Weidenreich thought they were: direct descendants, on Java, hundreds of thousands of years later, of the original Java Man. But Solo Man will be hard to interpret until his face and teeth are found.

We have good remains, therefore, of three kinds of men in the Far East, at times running from early to late in the Pleistocene, and all seeming to be related in type. We cannot readily see their relationships to the other ancient men, and it should be remembered that the Far East was also distinct in stone tool working

from the West. All the other significant fossils come from the other end of the Old World, anyhow—from Europe and nearby Asia—excepting for a couple of lonely Africans.

An African or so

One of them is still an obscure kind of person, represented at the moment only by a bent jawbone and a broken snout, not necessarily belonging to the same individual, and with badly worn teeth. These parts were found in the same deposit in South Africa as one of the man-ape types, and have been christened *Telanthropus* by the discoverers, Broom and Robinson. It has been held by some that the fragments are simply a small female of the man-ape type of the locality. Fortunately, however, there are many good specimens of this man-ape, and Robinson, from careful measurement and analysis, is convinced that the *Telanthropus* parts are too clearly removed from them, and more advanced. He believes, in a word, that here we have the first signs of a new ancient man, who might be roughly compared with the Java Man and who, as in the case of Java Man and *Meganthropus*, was living cheek by jowl with a still more primitive man-ape. But until further remains come to light, *Telanthropus* is not going to tell us much.

The other African type is Rhodesian Man, mysterious and important for different reasons. His first skull, in good shape but



The skull of Rhodesian Man, from Broken Hill

minus its lower jaw, was found in 1921 during mining operations far down the sloping back part of an old cave in Broken Hill, where some other Rhodesian man may very well have tossed it. He certainly was not buried. Nearby were other human bones, from at least two people; hipbones, a sacrum, and some leg bones. They do not differ from our own. The top part of a second skull, broken into two dozen pieces, was found in 1953, naturally exposed by the wind, near Saldanha, north of Cape Town, and a long distance from Broken Hill. It is very similar to the first one in appearance.

Thus Rhodesian Man evidently occupied most or all of South Africa. But when? Plenty of stone tools were found at Saldanha of types from the Middle Pleistocene on up. But the skull parts cannot be safely associated with any of them, and so the skull might be early or late. At Broken Hill there are no signs of great age (though, again, this is a place of little Pleistocene change). The animal bones found are almost entirely of modern species. Stone implements from the cave suggest (like the animals) that the date for the Broken Hill skull is late, or Upper Pleistocene, and perhaps about the same as Solo Man. One oddity: near both of these human types (Rhodesian and Solo) round stone balls were found, believed to be bolas stones. These are tied together by short thongs to make a throwing weapon by which a skillful thrower can entangle the legs of game, even flying birds.

This is not to be taken too seriously since the bolas was a widespread weapon then and later (it is not used today in Africa), but it does indicate that Rhodesian Man, like Solo Man, probably goes into the late Lower Paleolithic. The Broken Hill skull, moreover, suggests the Solo skulls in a few ways. Foremost is the tremendous, straight bar of bone over the eyes, the largest known in man. Behind this the brain case, as in Solo Man, is low and somewhat ridged, and the forehead negligible; and at the back there is a sharp crest of bone for the neck muscles, so placed as to show that the head was carried more or less vertically. Beyond this, however, the skull itself is much less heavy, and is deeper, with a brain volume of some 1300 cubic centimeters. Whether

the face was anything like Solo Man cannot be told, but the Rhodesian face is very large, and not projecting, though primitive in form. The teeth form a short, round arch of modern type, contrasting with the Java or Pekin men. The teeth themselves are large, badly worn and very badly decayed. This skull, as a whole represents a primitive type, living well along in the Pleistocene with its special and distinct features, some of them rather advanced, and with a brain size at least which was close to modern man's.

The Neanderthal family tree

Everything else we know about the men of the Lower Palaeolithic pertains to a final province, Europe and western Asia. It is principally the story of the Neanderthals,¹ but bound up in it is the baffling question of our own particular parentage, the origin of living men.

Unlike developments in the Far East, most of the story takes place fairly late. There is one early kind of man, known only from the Heidelberg (Germany) jaw. This is one of the most ancient relics of man anywhere (except for the man-ape types), since it belongs to the first interglacial period (some think later) and so is equaled in age, if at all, only by the earliest of the Java men. But it is not like the Java jaws, and could not easily be mistaken for one of them. It is not quite so massive, is relatively somewhat shorter and deeper, and the teeth are rather small for the jaw itself, being nearly of modern size and appearance. The whole is simply a different style of thing from the Java Man's jaw, and might be looked on, I think, as closer to what one might expect in a direct descendant of the general australopith type, or something like the battered *Telanthropus*, to which it bears a few likenesses.

In the other direction, the Heidelberg jaw may represent an early forerunner of the Neanderthals, and is generally so re-

¹Nay *ander* tahls.

dated, because of certain resemblances and nothing to prove the contrary. One of the Neanderthal skulls, from Steinheim in Germany, may be as early as the third glacial phase, but all the rest are third (last) interglacial or early fourth (last) glacial. The earlier and the later ones must be kept separate for the moment because there are significant differences between them.

The earlier, third interglacial specimens cover a good deal of time and space, having been found in Germany, Italy, Yugoslavia and Palestine. They vary among themselves somewhat,



Skull of one of the later Western Neanderthals, of Mount Carmel Man and of modern man

which is not surprising, but they do not resemble any of the types of man I have already described. They disclose a mixture of traits which we would call primitive and (looking at ourselves) advanced. Their brains seem to have been no smaller than our own, too, on the average. Also there appears, for the first time, and in some more than in others, a head shaped something like ours, being high above the ears, with relatively vertical sides, and with a forehead we can actually acknowledge. But this brain case was necessarily fronted by a prominent bony brow ridge across the forehead and by a face of comparable brutality. This face does not differ in the mouth region in the primitive way of the Java or Peking men but instead is rather prominent as a whole, with a correspondingly large aperture for the nose. The jaw varies: in some cases it is long and primitive, with good-sized teeth; in others there is actually something of a projecting chin.

So in these earlier Neanderthals we find a human population,

definitely cruder than the modern type of man, but seeming to approach it, erratically, in various of their traits. The closest approach, of this population, was made by the people of Mount Carmel in Palestine, who lived much later than the others, after the fourth glaciation had already reached its peak. (Another such late specimen of the early type may be the boy of Teshik-Tash, away out in the Uzbek Republic, north of Afghanistan.) These people had brain cases almost like ours, but had also the heavy brows and the big noses of their earlier relatives, and even some minor oddities of the bones of the skeleton.

But in this same later period a strange development had taken place among the Neanderthal people of western Europe: Germany, Italy, Belgium, France and Spain. Those I have already described would agree with general or popular notions about Neanderthal Man: something like ourselves, but marked by a primitiveness in the face, less obviously in other parts. The later Neanderthals would give you the same impression, but more so; from their remains they look as though they had gone backward rather than forward, and certainly they were a most unusual kind of man. Their heads had become long and low, bulging at the sides and pointed at the back, as though squashed down, and in fact the whole base of the brain was more flattened out instead of being strongly curved down behind the face.

Nevertheless the brain was of the same size as ours. The head slouched somewhat farther forward on the neck than in ourselves or in the early Neanderthals. The forehead sloped more sharply. The brow ridges assumed an odd, curved form over the eyes, like the upper rims of spectacles but thicker. And the whole face jutted far forward, so that the cheekbones were not "high" at the corners, but ran back in a smooth curve from the large and protruding nose. The face was long. The teeth formed a generous U-shaped arch, and the large lower jaw receded without any chin prominence.

Strangest of all, the bones of the skeleton, which seem to have been quite modern in all other types back to Java Man, took on an extraordinary character. They became coarse and heavy, par-

ticularly the bones of the limbs, which were bowed and thick-jointed and had various other special features of proportion and attachment of muscles. All this produced the well-marked types of the Neanderthal men who lived in the caves during the cold of the fourth glacial advance.

If the sequence of events were the other way around, we might easily assume that such a coarse and primitive human type had given rise to the more progressive Neanderthals of the third interglacial, who were more like modern man. But the sequence of events is not the other way around, and we can only suppose that the late Neanderthals of the Western caves were a highly specialized offshoot of their more advanced predecessors; peculiar, rather than being primitive in the sense of "ancient and unevolved." We cannot explain this evolution at the moment. But there is more to the story, relating to our own place in it.

Now, after the first thrust of the fourth glacial advance, one of the clearest events of the whole Stone Age took place. The slate was wiped clean, so to speak. In Europe, men of our own kind appeared, with a new and advanced kind of stonework and hunting culture. If these men had charged across the continent with the express intent of killing every Neanderthal in sight the effect, as far as we might tell today, could hardly have been different. Their tools and bones lie in the levels directly above those of the Neanderthals in the western caves, and there is no continuity or overlap between them. The Neanderthals vanish. It is inconceivable that there could have been a simple transition from one population to the other—a sudden change from Neanderthal to the later type. Just what took place we do not know, but a triumph of the new people in the competition for game would explain things; there need not have been actual enmity. It is plain that the intruders must have come from outside western Europe, most likely from the East, but here again we do not know. There is so much still to find. We know far less of the rest of the world. But the general effect looks much the same outside of Europe: the people of the Upper Paleolithic were of our own kind. There is no

sign that any other type of man existed, anywhere, past that same milestone that marks the end of the road for the European Neanderthals.

*Enter *Homo sapiens*—but when?*

What is "our kind" of man? It is the physical type which is usually called *Homo sapiens*, though it is not safe to suppose that this fellow is really more knowledgeable than the equally big-brained Neanderthals. What distinguishes us from all the men I have described is a final refinement of the head. It is neatly held fully erect on a slender neck, which does not fasten its muscles over a large area and on a prominent ridge at the back of the skull. The skull itself is high, well curved over the crown and well filled out, and its walls are thin. The brain overhangs the whole face, so that the forehead is nearly vertical. If there are brow ridges they are not heavy or, so to speak, structural, finishing off the top of the face; instead they are essentially vestigial, being bumps on either side of the mid-line (still with sinuses inside them). The face is small and more delicate than in other types, so pulled in below the forehead as to give the nose a bridge, and actually producing hollows in the cheekbones on either side of the nose. In the mouth there is some racial variation in the general amount of projection and size of the teeth, but the retraction of the mouth is extreme and the shrinking lower jaw has developed a chin as a new kind of stiffening for its arch.

This is a well-defined form of head and face, which characterizes all living men and is distinct from other types of men, being more advanced in an evolutionary sense. Yet the form is approached in some details, as I have said, by some of the earlier Neanderthals of Europe and by the later Neanderthals of Mount Carmel in Palestine.

Where did modern man come from? Now the elements of the puzzle begin to gather. The modern types, in Europe and elsewhere, not only seem to arrive rather suddenly but also to a con-

sizable extent in the guise of the very racial types of the same area today. That is to say, the so-called Cro Magnons of Europe, who followed the Neanderthals, look entirely "White," or like modern Europeans, in skull and face form. Early skulls of Java (Weljak) or of Australia itself (Keilor?) look like the living natives of the Australian continent. Some see a similar correspondence in South Africa, which is less convincing, and also in China, where three Upper Paleolithic skulls from one of the Pekin caves (of late date) look, to me at least, like a probable pre-Mongoloid, rather nondescript in type and possibly resembling American Indians in the flesh. What kind of background or explanation can we assume for all this?

Dr. Weidenreich, the great student of fossil men, had an easy one. Each modern racial form evolved in its own part of the world. Java Man grew into Solo Man and later into the rather heavy-skulled Australians. Pekin Man, with certain "Mongoloid" traits of the teeth and jaw, developed into the Mongoloids. Rhodesian Man fathered the South Africans, and the early Neanderthals gave rise to the Whites. All this came out even as to time, so that modern man is simply the coincidental appearance of the finally evolved form of several races with separate histories.

There are very serious difficulties with this theory. The main one is that evolution in different, related lines does not work quite this way, and does not come out even everywhere. The fact is that the modern races of man are actually very similar physically, certainly in the features of their skeletons, and much more so than the different lines from which Dr. Weidenreich supposed they sprang.

The opposite extreme from Weidenreich's view is that early kinds of man became more and more different in different parts of the world (the more usual pattern of evolution), that natural selection and culture favored larger brains as well as better-balanced heads, and that some lines progressed faster in this evolution, above all our own. All but this last became essentially extinct, the "essentially" being an allowance for an unknown amount of mixture with the survivors. Simply put, *Homo sapiens*

must have had one definite, single source, not many, even if you wish to allow that he became somewhat mixed in different parts with remnants of rival lines.

One version of this theory has it that modern man evolved, fairly quickly, out of the early Neanderthals near the end of Lower Paleolithic times. These are the people who do in fact show a few resemblances in head and face form to ourselves. The idea is that one branch of this line shook off its heavy brows, large teeth, full midface and certain other traits, in some part of the world not yet known, while another branch, the later European Neanderthals, fell off the evolutionary train and came out with their astonishing flat heads, bowed limbs and other special features.

This hypothesis may be rushing things a little. Furthermore, it does not take account of a few other fossils I have been holding up my sleeve. It is still possible to suppose that *Homo sapiens* did not grow out of the Neanderthals very recently, but rather that he had a family line quite independent of them, as of the others. Actual proof of this, of course, would have to be the finding of skulls of modern type but of Lower Paleolithic date. Such skulls have apparently been found.

One comes from Swanscombe, England, where two bones from the head of a young woman lay a short distance apart in a layer of the deep gravel of the banks of the Thames. The layer itself is believed to have been deposited during the second interglacial period (i.e., long after the Heidelberg jaw but long before all the Neanderthals), and the stone tools found in the level with the skull are of the middle of the Acheulean sequence, supporting the same date. The two bones are the left parietal (upper side wall) and the occipital (back and base). For a modern woman they would be a little thick, but not impossibly so, and the skull has a slightly primitive aspect in the sense of "primitive for *Homo sapiens*." Otherwise this whole top and back of the skull is what might be found in modern skulls. It cannot be matched with that is to say, it is certainly distinct from—other men of the Lower Paleolithic: the Far Easterners, Rhodesian Man, and almost all

of the Neanderthals. But it cannot thus be clearly distinguished from the same parts of some of the early Neanderthals, notably Steinheim, which you may remember to have had a rather modern-looking, if small, brain case. And of course the Swanscombe skull entirely lacks a forehead and face, so that no one can say in court that it did not have Neanderthal features in front. Some think it did. But others feel that the skull as it stands suggests our own type so strongly that we cannot assume it was a Neanderthal. There the matter rests.

Two other fragmentary skulls have been found in a cave at Fontéchevade (Charente) in France, along with implements of a particular industry known as Tayacian and with the bones of warm-weather animals. This industry is definitely known to be pre-Mousterian (Mousterian material lay above the skulls in this same cave), and the finds have been dated by common consent as third interglacial. This is well after the Swanscombe remains, but very positively earlier than the bulk, and possibly all, of the Neanderthals. One of the specimens, comprising the top of the skull only, resembles modern man and also the Swanscombe bones, and has the clear indications of a vertical forehead. The other specimen is only a fragment of the forehead above the nose, but it is thin, delicate and vertical, and has almost no signs of a brow ridge—only a degree which would be reckoned as small even in a modern woman. It is quite impossible to consider grouping such a skull with the Neanderthals, early or late. It must be concluded that men with modern foreheads and brain cases existed at the same time as the Neanderthals we know, or earlier, and while the latter were still undergoing development.

There are other possible specimens of early *Homo sapiens* known, from Europe and East Africa, but none with the brass-bound evidence of ancient date which we have for Swanscombe and Fontéchevade. And it may seem odd that, if *Homo sapiens* did indeed exist in these earlier periods, we have not found more of his remains, compared to the fairly numerous finds of Neanderthals in the third interglacial and fourth glacial. But it should be remembered that, if the Neanderthals were holding the European

fort during this time, they were thus occupying the one part of the world which has been examined and picked over with extreme care for fossil man. Finds in other parts of the world, or from earlier periods, have been made much more rarely.

The Piltdown prank

Somewhere in this business there may belong part of the appalling Piltdown mystery. It was a great relief when the jaw found at Piltdown was revealed as a sheer hoax. For "Piltdown



The Piltdown skull, showing the fragments of the brain case found (also the nasal bones), pieced together and assembled to give the general form of the skull

"Man," human in skull and ape in mandible, had once been thought possible, but had lately been becoming an intolerable enigma in the light of everything which primitive jaws found in Java and South Africa had taught us. It is now quite evident that human ancestors, no matter how early, never had chins and front teeth like a chimpanzee's, and yet that is what the jaw from Piltdown had argued.

Now the bogus Piltdown jaw was something which could be manufactured by a hoaxter from materials at hand, to wit, a chimp jaw. But the skull fragments are something else again. They give us a skull of modern size and shape, with a high forehead and the feeblest of brows, but they are astonishingly thick. You could not

find such a skull in modern man to use in your hoax (there is no sign that it is a product of disease). And the chemical tests support the fragments as being genuine fossils, probably of the third interglacial.

Yet the hoax may have reached even to the skull parts. Three fragments were found, a few years after the first, a couple of miles away, and thought to belong to a second Piltdown person; and this was one of the great arguments for the reality of Piltdown Man. One of these, a molar tooth, turned out to be fraudulent; another, from the back of the head, had been tampered with, whether or not it was a real fossil. The third, a thick piece of brow, now looks like a genuine part of the first skull, and yet it, also, gives signs of having been stained to look old—a case of painting the lily. Was the hoaxter strewing pieces of a recent ape and a true-blue human fossil all over the countryside? The hoax was pretty thorough—even a crude flint “implement” was a stained-up fake. And yet the principal skull parts seem genuine, from their very nature and their fossilization.

All I can say is that, if the skull itself resists expulsion from the tiny college of ancient men, then it should be viewed as related to the above non-Neanderthal, Western branch of men which contains Swanscombe and Fontéchevade. It is not like those of the Upper Paleolithic, and in fact it looks pretty primitive in certain ways. But it is entirely unlike any Neanderthal, early or late.

Now to try to add this all up. It does appear as though the modern type of man goes back into the Lower Paleolithic, but the evidence is wispy. In the Upper Paleolithic things become quite different. A good number of skeletons is known, especially from Europe, and they are of course all *Homo sapiens*. The Europeans, spoken of broadly as the Cro Magnons, appear as “Whites” in their skulls and faces, and this type occupied Europe, North Africa and the Near East continuously from then on. But we do not know where they were domiciled, previously (when the Neanderthals were in Europe) or what relation they might have borne to earlier forms like Fontéchevade. Something like this situation exists for Australia, at the other end of the hemisphere,

where the early "modern" skulls are all of the Australopithecine type.

For the rest of the Old World there is a pretty complete blank as to the ancient roots of modern races, with little to fill it but speculation. Dr. Ccon and his colleagues have put forward strong arguments that some of the distinctions of our known racial groups are recent evolutionary responses to special habitats. Item: the flat, fat face and narrowed eye slit of Mongolian peoples, above all of the Eskimos and north Siberians, to protect the eyes and nasal passages from the savage arctic cold (they have arrived in warmer latitudes by migration). Such principles doubtless apply to many features, and it would seem easy, often, to ascribe dark skins to excessive tropical sunlight, but Dr. Ccon emphasizes that close examination of the evidence does not allow us make such precise explanations at present. When we turn to the features of the skeleton alone things are harder still, and the fact is that we are very poorly off for evidence taking our known races back in time.

For mankind as a whole we have seen that there was a substantial amount of evolution in the head during the Lower Paleolithic (most of the Pleistocene). The brain and the face progressed from the australopith stage to our own, though we still know far too little about the family tree taken all together. It is fair to suppose that the poverty of early tools of man, and the extreme slowness of their improvement at first, was partly due to the limiting effects of smaller brains. But it is not safe to take this notion too far. We have only the dimmest idea as to which men might have been making which tools; and the Swanscombe, Fontéchevade and Neanderthal men, all large enough in brain, did not produce any spurts forward, though the pace of culture speeded up gradually throughout. Furthermore, culture grows out of culture, and a very simple culture is a kind of prison from which it is difficult to break out of. All we really know is that, late in the Pleistocene, *Homo sapiens* prevailed and we find him in possession of Upper Paleolithic culture, with its clear superiority over what had gone before.

7

The end of the Stone Age

If you go to the town of Montignac in southwestern France, cross the bridge over the Vézère River, and follow the road around the shoulder and up to the crest of the hill, you find yourself before the entrance of the Lascaux cave. You can walk right into it by concrete steps and view it with ease; the floor has been deepened and it is dramatically lighted for you. Things were less easy for the hunters who by torchlight, some twenty thousand years ago, painted on the walls pictures of the animals they hunted. But they painted well and you will never—if you have as much soul as a microbe—forget what you have seen.

Huge spotted bulls face you. In a line, little red or yellowish cattle, rather Chinese-looking, prance down a corridor. All around the main cave and in galleries leading off are other animals, painted on a natural white background in shades of red, brown, tan, and purple, and in black: a row of antlered deer heads, a bison, a rhinoceros, a wounded bison with its entrails hanging below. They are painted with verve, and not by children or savages, but by men who knew how to portray what they saw, using only natural earths and charcoal, made into paint with animal fat.

These were the people of the middle of the western European Paleolithic. When you have finished with Lascaux and the others you are facing down a valley that was the Fifth Glacial of the late Pleistocene, thronged then with large game. It is filled with the caves and shelters used by the hunters, many of these other caves are also painted, engraved and sculptured. We meet at last the Cave Men you have heard so

much about. The late Neanderthals used caves, and many of the same caves at that, but it was the men of the Upper Paleolithic who decorated them so spectacularly.

However, the "Cave Man" label is a little unfortunate. Generations of school children have heard that "our ancestors lived in caves" and the whole thing has become a frayed item of



A horse from the Lascaux cave, in France

humor like a banana peel or a mother-in-law. Certainly the Cro Magnons and their confreres used caves and gladly; that is where we find their skeletons and their household rubbish. So also have other men used the caves, for various reasons, down to the present; and if the archaeologists of our own century had only left things alone the archaeologists of the next would doubtless find a layer of Coca-Cola bottles and beer cans overlying everything else in the case floors. But if the Paleolithic people had depended wholly on caves for shelter there would have been a fearful housing shortage. They are known to have made tents and underground houses and, if some of the cave paintings can be so understood, summer wickiups of sticks and brush.

It is difficult indeed to conjure up, from their skulls and their meager tools, any kind of a convincing mental picture of the hunting and daily life of the lowbrows of the old Lower Palaeolithic.

Not so for the later Stone Age, whose denizens stand out nearly in the round, and have not entirely vanished yet. They are the kind of "savages" we can recognize. These people were from the beginning "modern" men, as I have said, and also "modern" hunters, with a bigger bag of tricks and a richer inventory of items of culture than the Neanderthals or any others.

They were certainly skillful hunters and, in these glacial times, may have been especially dependent on meat as opposed to vegetables. For meat in those days went around in very large packages, from mammoth-size down through woolly rhino (in earlier phases and colder zones) and bison and large wild cattle, to the reindeer and the relatively small horse of the time. But this might be an unbalanced picture of diet, because most of what we know comes from Europe and North America (since this includes the time of the arrival of the American Indians), where climates were much affected by the glaciers. The rest of the world has been insufficiently studied, and in any case all Africa, and southern and eastern Asia, were somewhat behind in culture development.

This whole new phase, the appearance everywhere of advanced hunters, belongs to the tail end of the Pleistocene and the beginning of postglacial times. Open tundra covered only by moss and low shrubs, or grassy steppe, held sway while the ice sheets remained and retreated, giving way at last to forests in the newly temperate zone. The period runs from about 30,000 B.C. to about 6000 B.C. Both dates are loose, the first because it is not known at all exactly, and the second because it marks the end of the true hunting phase in just one place (the Middle East), when farming began. It has been ending in other places ever since, and has never ended at all in a few. It is the period of the Upper Paleolithic and the Mesolithic. These are old names, meaning (upper) Old Stone Age and Middle Stone Age respectively; the distinctions are now almost meaningless, but the names have remained in good use for other reasons.

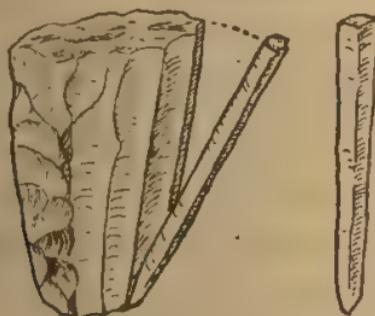
During the Lower Paleolithic the basic industries or stone-working techniques were apt, as in the case of the Acheulean and Levallois traditions at least, to be of the same general style over

enormous areas for vast lengths of time. The shorter Upper Paleolithic contained more variety in stone tools and other objects, and there was a larger number of distinct cultures, looking like the work of specific major culture groups. To call these groups "tribal" would be cutting it too fine, but that is the rough idea. In the old days, archaeologists used to talk about "periods" of the European Upper Paleolithic, and you may have heard of them: Aurignacian, Solutrean and Magdalenian. Nowadays they think instead of somewhat different populations (you might compare them with some of the main American Indian types, like the Plains versus the Pueblos) with different cultures, partly existing at the same time and partly succeeding one another in Europe or parts of Europe, as new immigrants or influences arrived, or as changes took place on the spot. The main series of events is the same, and the old terms still have some meaning. But the archaeologists today see much more complicated groupings, as they work out finer distinctions of stonework, and as they plot these all on the map, observing how they are related to one another in layers in the ground at a great many different ancient living sites.

As things now stand, there were two early traditions, one called Perigordian (comprising the Chatelperronian and Gravettian) and the other Aurignacian, each of these made up of rather complicated successions in themselves. The former Solutrean "period" seems to have been instead a relatively short florescence of some older ideas, perhaps of African derivation, which were specially developed both in eastern Europe and in Spain; this outburst of striking stonework was relatively short. The latest phase in the west of Europe was the Magdalenian; but if you are considering the final stages of Europe as a whole, the picture is more varied, with several related or legatee local cultures to the north and east, all running on to the end of the Paleolithic.

Virtuosity in stone

The manufacture of stone tools was more of an art than ever before, and involved some new inventions. And, instead of a few kinds of tools only, these cultures had literally dozens of forms. But they all began in the same way, being made from a parallel-sided flake called a blade. In the Levallois school, a core was prepared to look like the back of a tortoise, and one flake knocked off



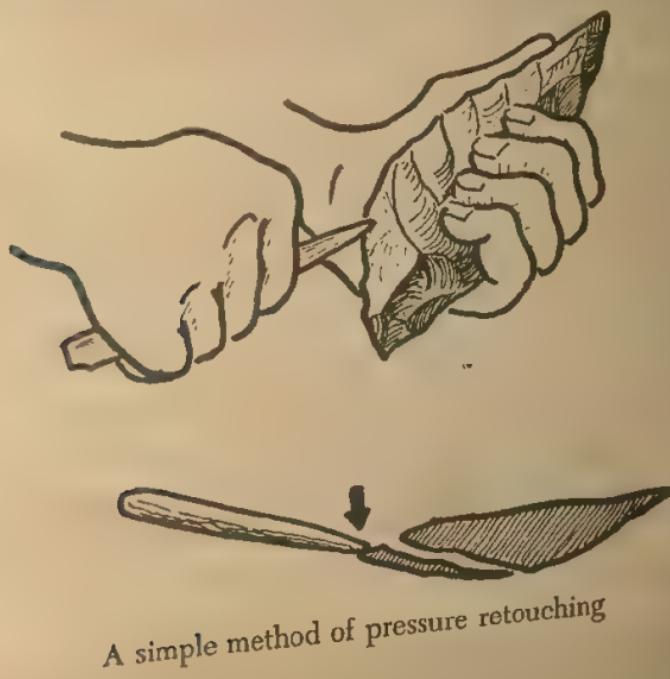
The making of flake blades

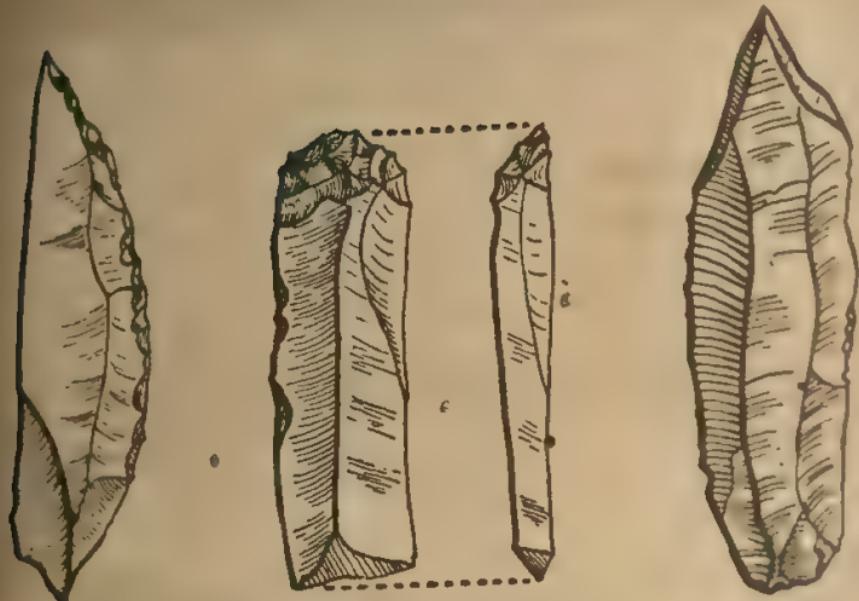
for a tool. By this new method, a core was made to look like a medium artillery shell, and a strip flake was knocked off, from the edge of the butt end, running down the side toward the point, giving in its most perfect form a long knife with two razor edges and a slightly curved-in point. This process probably involved wrapping the core in a skin to get the right distribution of pressure, and using a bone punch along with a stone hammer in order to direct the critical blow to exactly the right point on the butt end from exactly the right direction. A large number of such blades could be struck off a good core, one after another like the leaves of an artichoke, until there was almost nothing left of the core itself.

This achievement in forming a blade was complemented by an achievement in finishing up the tool, pressure flaking. Instead of a small chip being struck off the flake by a blow, it was pressed

off with a small bone tool in some way, which would produce no shattering effect and made it possible to apply just the same pressure for every chip at exactly the place wanted. So, for giving final shape to an implement, it was something like using a pen-knife for whittling in place of trying to whittle with an axehead.

The raw flakes struck from the core were used like a key maker's blanks to make all the other kinds of tools needed, by this pressure retouching. You might want a knife; you could hardly use the sharp untrimmed blade because you would be as likely to cut your fingers as your chop. So you would dull one edge simply by bruising and blunting it. The working edge, also, would be too sharp, being likely to nick and break down, to say nothing of leaving little chips in the food. So you strengthened it by working it back with pressure retouching, which thickened the edge while still leaving it quite sharp enough to be efficient. A deliberately duller and steeper edge gave a scraping tool, for cleaning the flesh away from the inside of an animal's hide with less danger of accidentally cutting through the hide itself, and so spoiling it. An easier scraper to use was an end scraper, from a flake with blunted sides and a rounded, steeply flaked end. A spear point





Upper Paleolithic flake-blade tools. Left, a knife. Middle, an end scraper. Right, a burin or graving tool

was made by retouching both edges and bringing them to a point, reshaping the tool as much as necessary.

These are basic tools, and efficient ones. But the Upper Paleolithic brings into prominence whole new sets of secondary stone tools, made for working wood and bone into the actual tools wanted. Concave scrapers are found, for shaving down the shafts of spears or darts. Awls were made, for drilling holes in either bone or wood. And for all kinds of work with these materials there existed a number of different types of small chisels or engraving tools, made by striking a flake from the blade the wrong way, so to speak, against the point, leaving a shoulder with a narrow, sharp edge. Such a "burin," or graving tool, was in fact the most characteristic object of the whole culture. Perhaps you can begin to see how much more at home in nature human beings could make themselves than ever before, with such a kit of tools.

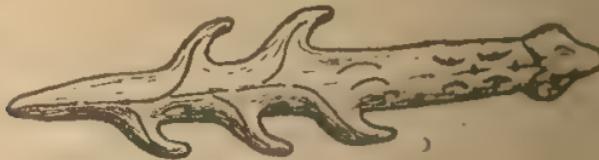
This is the general picture of Upper Paleolithic stone implements, all of them showing skill and ease in workmanship, even to the point of apparent carelessness in some of the Magdalenian work. The opposite extreme, very great skill and symmetry, char-

acterizes the Solutrean culture, which spread across Europe for a brief time. Its best work, from France, includes such things as "laurel leaf" spear points with ripple flaking. These terms bespeak the perfection of shape of these points, and also the mettalic expertness of technique, by which long shallow chips were pressed off from the edge toward the mid-line, each chip being parallel and practically identical with its neighbors, and making a surface effect like ripples in water or sand. The Solutreans obviously exist



A Solutrean point

stoneworking as an art, and their work has been paralleled only in a few places, in Neolithic Europe and Egypt, and among some of the American Indians. It is something outside the ordinary utensil-making tradition of the times in Europe, and may have been the influence of an African tradition of pressure flaking; it appears to have incubated in Spain and also to have had another last growth in Hungary.



A Magdalenian bone harpoon head

Not only did the Upper Paleolithic hunters thus equip themselves handsomely with stone tools; they also made plentiful use of bone, ivory and antler, which the Lower Paleolithic people had been too foolish to try to work into useful forms. They began

or darts with simple points for spears or javelins, and also with bone awls, pins and needles. Later on, among the Magdalenians, bone or antler tools rose markedly in importance, especially with the appearance of harpoon heads having a set of barbs running down one or both edges.

The harpoon shows what advances had now been made in weapons. A spear tipped with flint was probably the first and most efficient weapon, but this was improved on by the end of the Upper Palaeolithic. A barbed bone or antler point, called a harpoon head (and this is what the Magdalenian points seem to be), is meant to come off its spear shaft on striking into an animal, and to be attached and held (perhaps to a drag) by a line. This is how it is used by Eskimos for seals, and by Norwegians for whales. Probably the Magdalenians used it for reindeer. At any rate they had another weapon of importance: the spear thrower. This is a shaft which you hold in your hands at one end, while you also clasp the shaft of the spear harpoon or javelin. The end of the spear thrower has a peg or a stop, against the butt of the spear. As you throw the spear, the thrower lengthens your arm and the whiplike motion adds a great deal of force to the throw—if you have ever thrown green apples off the end of a pointed



How to use a spear thrower

stick you will know what this means. It is not an easy weapon to aim, and beginners would have trouble hitting the side of a barn. It adds force rather than distance, and helps to make a spear penetrate a large animal like a bison or a walrus, and inflict a serious wound, where an arm-thrown spear might be successful much less often.

The Paleolithic people doubtless also used pit traps and such things, but if they had traps of any more complicated kind the parts have not been found. As to bows and arrows, it is not certain they were invented at all before the end of the Paleolithic; if so, they were not widely used. Some small amount of fishing may have been done in streams with lines, not with true hooks but with simple double-pointed gorges having the line fastened at the middle. Fish were also taken with multipronged small spears.

So the European of the Upper Paleolithic was pretty well off. He had supplied himself with good tools and weapons. Meat was plentiful providing he did not let timidity stand in his way, for there were copious quantities of large animals at first and reindeer at the end, all in open country. Along with his weapons he doubtless had special hunting tricks like driving the game over cliffs or through defiles. And he was obviously good at birding and at catching smaller animals: quantities of bones of the arctic grouse and of rabbits are found in different places used by him. What he did for vegetables, especially in this frigid climate, we do not know, but he probably did without to a great extent, or ate the contents of the stomachs of the reindeers he killed.

At any rate he seldom starved. We know all too little about his housing arrangements. About his clothes we can tell only that he had some, because of all the needles, and because it was cold. His social life is a mystery. But he has left us one impressive legacy, his art.

The art of the caves

One of the earlier forms was a kind of "art" still dubious among ourselves. It consists of little carved stone or ivory female figurines. They have been called, sardonically I think, "Venuses," which does not signify that they are beautiful but gives an idea all the same. They may not have been done in the spirit of the



The Venus of Willendorf

Louvre, but they were positively not done in the spirit of Sunday school. Their heads are uninteresting blobs, as a rule, but everything between the neck and the knees is unpardonably exaggerated. "Voluptuous" might be the word. "Fat" would be better. Some writers have supposed that they were fertility charms or something of the sort, but hunters are not as a rule anxious to increase their families—on the contrary. They may have been

nothing in the world but harmless Paleolithic indeletions, some of them are certainly ably done in the artistic sense.

The paintings, quite a different thing, began by being drawings in black, with the use of color and the height of achievement coming in the Magdalenian. Perhaps the finest work of all was in the Altamira cave on the north coast of Spain, showing a horse and boar and evidently having a date somewhat later than the Lascaux cave. But there is little to choose between these two.



A bison from the ceiling of the Altamira cave in Spain. The original was painted in red, yellow and black.

(though there are differences of style), or among many other French and Spanish caves. The artists also did sculpture in deep relief in the walls of some rock shelters, and engravings on the wall surfaces of others. Finally, the Magdalenian culture was much engraving and sculpture of small objects of bone, ivory, and antler. Some of it lay in the shaping of utensils such as handles or the ends of spear throwers, which might be worked into the form of an animal or bird, and some of it was seemingly done just for art's sake.

The surprising thing is the average excellence of the work by any standards. There are, certainly, examples of incompetence,

... I would expect to find whole caves spoiled by beginners, or by possible back fence artists, and you do not. Nor do you find such practice sketchbook material among the engraved stones, although Dr. Movius discovered a large pebble covered with animal forms carved one over the other, which he thought was actually an artist's sketch pad. From the beginning a large proportion of the work is the work of masters, men whose artistic sense and aesthetic senses were as powerful as the best of our own, and who were a match artist of the present just as surely as a good artist of the present does. Given the knowledge that the Magdalenians were, after all, just like ourselves, it is still hard to understand how they could have rung the bell so decisively and consistently without leaving more of a litter of their trials and sketches.

The paintings, in particular, were serious business, and it is at least possible to make out what they were for. The purpose was hunting magic, not picture galleries. Quite obviously they were made to give the hunters some degree of religious hold over the animals by directing or "injuring" the animals through spells, or to make them breed and be plentiful. It is the game animals that are used as subjects, and they are often drawn with spears actually thrust into them. Other objects of any kind, such as plants or human beings, are rare, and even these human beings are sometimes shown engaged in hunting or stalking (one man, or possibly a woman, in Spain is climbing a tree to steal honey from bees). Finally, the paintings are usually found far back in the darker recesses of a cave, not in parts which could be used for storage or habitation, and so they must have had some special purpose. Any interpretation is not simple guessing, because primitive hunters of our own times are known to have used hunting magic similar to this.

The paintings are a wonderful sight, and we can get great satisfaction from them. We can get information as well, but not much. They tell us what animals were hunted, and show as living creatures some that are now extinct. But they tell us almost nothing about the people. In contrast to the animals, men are sketch-

ily and carelessly done. They give no useful information about clothes (nor do the Venus figurines!) although some pictures do seem to indicate very hairy men. But it may be no more correct to think that all the men were hairy than that all the women were fat. A few Spanish scenes show hunting, and portray bows and arrows, a very useful fact. (But these particular Spanish paintings may be of later—Mesolithic—date.) Lascaux has various queer designs that make no obvious sense, and also shows things that may or may not be houses. And that is about the size of it.

All this time the ice sheet had been retreating from northern Europe and, after a last stand on the Scandinavian peninsula, it expired altogether sometime not long after 8000 B.C. Some of the Pleistocene mammals, such as the mammoth, had expired much earlier; others, like the bison or the Asiatic horse, died out in Europe, while the king of Magdalenian times, the reindeer, followed the glacier north to his present home. Open country gave way to forests housing the red stag and wild boar. Hunting became more difficult all around, both because of the cover and because of the smaller number of large meat-bearing animals. To this extent the people of Europe fell on hard times.

Mesolithic masters of the hunt

At any rate Upper Paleolithic culture came to an end and was succeeded by the so-called Mesolithic, which developed partly from what had existed and may have been influenced partly by the late-starting Upper Paleolithic cultures of North Africa. The Mesolithic is looked on by some, distastefully, as a degeneration from the straight-out big-game hunting of the end of the Paleolithic. But the Mesolithic hunters actually have more in common with primitive hunters of our own time. That is, they were forced to balance both their diets and their habits: to use new inventions—which is certainly to their credit—and to fall back on a variety of comestibles their ancestors had disdained.

First of all they took up new aids to hunting. One was the bo-

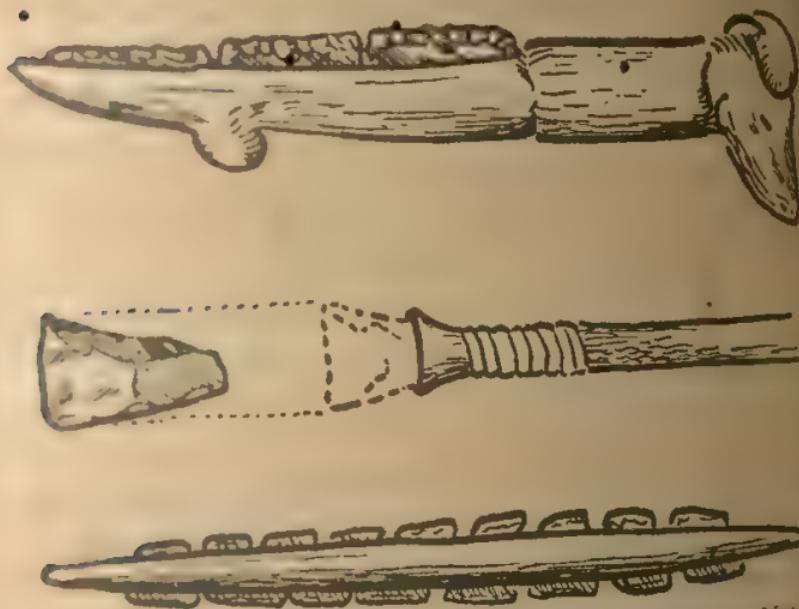
and arrow, which may have existed in Paleolithic times but, if so, was not much used. The bow is a wonderful device. It solves the problem of finding great striking force to inflict a wound, both accurately and from a distance, a problem at which the spear thrower fails. When you pull a bow, you store up all the force of your arms and shoulders in it, to release instantly, in the fashion of a gun, instead of more slowly, as when you throw a spear, on which you cannot concentrate as much strength anyhow. Thus the arrow has a high muzzle velocity, something like a bullet.

So in Mesolithic times the bow became the major weapon, using not only the familiar pointed arrows but also chisel-headed arrow points, and blunt-headed wooden arrows for stunning birds or small game without ruining skin or pelt. Another "invention" for hunting was the dog, whose parentage is not exactly known. Nor is it known whether people invented dogs or dogs invented people—who struck up the friendship first. Dogs are affable beings, and the chances are good that they took to hanging around the human camps hoping for scraps, and were tolerated in this way and later allowed to come along and make themselves useful in the hunt, long before they were actually "domesticated" and bred. They have had, in fact, this very status in some recent hunting cultures.

Secondly, the poorer returns from land hunting made for more appreciation of what the water had to offer. Shellfish had been eaten for a long time, but now they were depended on by shore dwellers to such an extent that thick layers of shells were piled up where the people came to eat, especially in Portugal and in Scandinavia. Pike, speared in the rivers, also were widely eaten, instead of rarely as formerly. True fishhooks are found in Mesolithic remains, showing that line fishing was important. Furthermore, the canoe came into existence, which made possible not only marine fishing but also the hunting of seals, in the North, with harpoon and line. Nets and fish traps were used, and their remains have been recovered. Finally, stranded whales gave the Mesolithic people an occasional windfall (Mesolithic implements have been found with the skeletons of several of them). Now this

is certainly a thumbnail sketch of Mesolithic sea food, but that should not diminish its significance or that of the various inventions and devices connected with it.

Added to all this, the Mesolithic people must have filled out their diet with a good deal of "gathering" as distinguished from hunting, but this is hard to learn about; we do know that they ate hazelnuts and wild pears, because some of these got charred enough to last to the present in the remains of Mesolithic homes



Blades or microliths of Mesolithic times, as used in tools. Top, Natufian sickle, Palestine. Middle, transverse arrow, Denmark. Below, Maglemosian spearhead

What about the remainder of Mesolithic culture? There were certainly tents and huts for living in, doubtless of a variety of kinds in different regions. The Palaeolithic people had been forced, in places, by the shortage of wood to make use of mammoth ribs to cover their underground lodges, and even to burn bones for fuel. But the new forests provided wood in plenty now for woodworking. This was not like the old hand-axe, but rather a true axe like ours, for hafting on a handle, and with a cutting

edge usually skillfully made by striking off a large flake across the end. The other characteristic of Mesolithic stonework was a dependence on microliths or pygmy flint blades of different shapes, which could be used for points or barbs of arrows, or for hafting into a piece of bone to make a composite knife blade or a pointed tool.

This general kind of culture shows us artful and able hunter-gatherers succeeding to the rather extraordinary world of the late glacial period and coming to terms with a world of the kind we know. Now almost the whole earth was occupied, and by cultures of this general type. The interminably long advance of human hunters from the baboon-bashing stage of the australopiths to the tricks and skills of the postglacial day was coming to an end. As elsewhere, there were actually different varieties of Mesolithic culture in Europe. The early and spotty Azilian, which may have been simply a gone-to-seed Magdalenian, had badly made harpoons, and pebbles painted with mysterious lines and designs. The Tardenoisian culture was the most widespread. The Maglemosian was a bog culture of northern Europe, making the most of a water life and also working wood with axes, which included felling trees to furnish support for their living sites on the soggy ground at the bog's edge.

There were other local cultures. In some of the latest, remains of badly made pottery are found. But it is not clear whether pottery was a really Mesolithic invention as far as Europe is concerned, for by this time it was already being made and used by farmers in the Near East, and we can only assume that it found its way to the backwoods of Europe like glass beads to the Indians. For the fact is that Europe was not the scene of civilization or of higher culture. It received them in due course, and sooner than some parts of the world. But in the Mesolithic, which here lasted until after 4000 B.C., the Europeans were just "natives."

8

The last living hunters

As farming, followed later by civilization, began to spread like ripples from a splash, the Mesolithic peoples all over the earth gave way before it or adopted it. This went on for thousands of years, in different places, up to the time when European culture underwent its renaissance in the Middle Ages and burst out of its own domain all over the world. Then the Europeans with their "world market," absorbed or upset existing societies in many parts, especially America. But even at the time of their first venturing forth—let us say 1492—they found the Mesolithic survivors already pushed to the wall by other "primitive" peoples. So far, in fact, that they had been shoved nearly out of harm's way for the time being, and have hung on better than many others. It is only in our own day that they and their way of life are at last disappearing for good, as we ourselves find ways and reasons for going into every cranny left on the earth.

That is to say, they were by 1492 already "marginal" in all senses of the word. Some were marginal in being remote and isolated, literally at the world's ends: the Bushmen of South Africa, the natives of Australia, of the Andaman Islands in the Bay of Bengal, and of Tierra del Fuego at the bottom of South America. Most have been marginal in their resources and territory, and have survived to this day because what they had no one else wanted, and their kind of rude gathering culture was the only way to make a living in these places, such as the last Bushman stronghold in the Kalahari Desert, or the barren ground and arctic parts of Siberia and America. Now, nobody could get more out of the Arctic than the hearty, brainy Eskimos, with their extra-



The surviving hunting cultures of recent times

any inventions to defeat the cold and the ice, and so nobody disputed it with them. But the Indians in New England, culturally more advanced, had good land on which to grow the corn that gave the Pilgrims. And where are Massasoit's villages now?

The Bushmen, ancient hunters of South Africa

such survivors as I have mentioned, especially those who were still in a reasonably good environment, can put flesh on the bones of the Mesolithic, and show us what a hunting-gathering culture was and is, and what it means. The nearly vanished Bushmen of South Africa, in fact, run right back into the archaeological past, though some of the connections are not as clear as they might be. For they certainly once occupied all of South Africa, and probably extended far up into East Africa as well. The Bushmen made cave and wall paintings, both recently and long ago, which are like the European ones; they may not have the skill of the finest of the latter, but on the other hand they are like those of eastern Spain, with lively animals and human figures in action scenes, done in several colors. And, under the

Stone and bonework the recent Bushmen have left in case other stone cultures going back in a sequence to the beginning of the Lower Paleolithic.

But it is not known for certain how far back in this sequence the Bushmen go, or whether the earliest as well as the latest industries are theirs. Nor do we know anything about the ultimate origin of the Bushmen, and their odd physique. The Rhodesian Man was there long before, and in Upper Paleolithic times there were other, modern men of larger size than the Bushmen, though entirely different in skull features.

The Bushmen are strange little yellowish-brown people, the skull almost as small as the Pygmies of the Congo, and they have hair which forms tight screw curls. But they seem different from the Negroes, having triangular, rather flat faces and noseless, rolling eyes and, of course, the famous and astonishing habit of some of the women to lay up fat on the buttocks until they project rearward as does no other human being. This goes on while they are eating well, and goes down again when they are not. Such a camellike peculiarity suggests that the ancestors of the Bushmen evolved it as a special response to hard times during a long isolation from the rest of mankind in South Africa, but there is no positive explanation for it. Nevertheless, the probability remains that the Bushmen are an ancient branch of Homo sapiens, perhaps mixed somewhat with Pygmy or Negro.

Not so long ago the Hottentots came down into the old Bushmen territory, driving cattle. The Hottentots themselves apparently arose from a Bushman-Negro mixture, and had got their cattle from the north. They took up pastoralism in the hunting lands of the Bushmen, and the Bushmen retaliated by hunting both cattle and Hottentots. Then came the Bantu Negroes with much more solid villages than the Hottentots, displacing both of the other peoples and reducing the Bushmen ever further. The Bushmen found a final enemy in the Dutch, who moved up from the Cape with cattle and sheep, losing these to the Bushmen and killing the Bushmen and their game in return. It was not long before there was little left to the Bushmen except the inhospitable

other area, with the Kalahari Desert, and this is where their hunting grounds live today.

They go about in small bands, or even families, looking for game in shifting localities as the game migrates for the season. Practically speaking, all they think about is food, especially in their present poor home, and life is a hunt for it.

They broaden their diet by not being choosy about what they eat, which means just about anything they can digest: not only their preferred game, the larger species of the antelope tribe, but also hens, hyenas, rats, poisonous snakes, lizards, scorpions, insects, grubs, and any kinds of seeds, berries and roots.

They broaden their diet once again by not being too particular about the state of the food, for they are able to eat putrid meat, an overdue ostrich egg that smells, Europeans have said, as you could not believe an egg could smell. This has dumfounded many travelers; the Bushmen take real pleasure in eating things you might think would annihilate them.

They broaden their diet in a third way by eating prodigiously when they can, and, contrariwise, managing to put up with starvation when obliged to, or to go absolutely hungry for considerable periods. Many people have seen two Bushmen eat up a whole sheep, or comparable amounts of wild game, in half a day;

I shall be describing native peoples all over the world in the next parts of this book, as they were in the time after they had been seen by Europeans who could make records of them but before this European contact had greatly altered the lives they were living. Some are still in that state, some have departed from it only since 1900, and some have had hardly a taste of it for generations. Yet, taken all together, these tribes are the most something different from the archaeological past, on the one hand and the people of history—the fixed phases, the Caesars or the Incas—on the other. Since they are to be compared with one another, I shall use the "present tense except where it is an absurdity. This has been called the "anthropographic present" by my colleagues Chapple and Coon; it is a literary device and a way of meeting an embarrassment, like the editorial "we." "Present" is not a literal one: it may be now, or fifty or three hundred years ago. But it is an attempt to treat these important peoples and cultures as though they were all available for our inspection, as we would want to see them in their pristine condition. But I cannot always avoid the past tense when a tribe used to drink blood, and I hope that occasional tense for this reason will be understood and forgiven by the reader.

and here a "whole sheep" does not mean just the parts we class as intestines and all. (This kind of voracity and indiscriminate eating up of everything edible is seen among other such primitive hunters in all parts of the world.) It is certainly a real accomplishment, and not something we could manage without training, to say the least. This is when the women develop their bump of breasts. Now you will remember that the Upper Paleolithic Venus figurines are all very fat little women. Some students see signs of the same trait (called steatopygia) in them, although their appearance is more one of general plumpness (which would in fact have been better suited to a cold climate than would a big bump). In any event, it may well be that they are Paleolithic plump girls, and that the ideal healthy beauty of that icy day was a grossly overfed one, reflecting in one way their hopes and **prayers about food.**

Taken altogether, you can see that the Bushmen have accommodated themselves, by their dietary elasticity, to the uncertainties of their food supply more completely than you would have thought possible. How have they organized themselves in positive fashion so as to obtain their food? While they will eat anything, they prefer wild vegetables and the flesh of typical game animals, and they hunt these both individually and communally, and always share a kill regardless of who made it (this is another trait typically found in such primitive hunting groups). It is the business of the women to go out from the camp daily to forage for berries, wild plums, wild melons, wild veldt cabbage and many bulbs, roots and other such, often using a weighted digging stick to root them up. They take the children of all ages along, and the older of these help in the gathering. The men have charge of the serious business of hunting, and go farther afield in it.

Their hunting weapons are several. They use spears to some extent, for larger game such as a giraffe. They also have a throwing club, or knobkazie, a fat-headed stick two or three feet long, with which they expertly bring down birds and small game. But their main standby is the bow, a small one, by which they shoot

and arrows. The arrows are usually light, and made with a slate hardwood point as long as your hand (so that the shaft will break off when the point sticks into the prey, and can be picked up again) but some have stone-tipped points (or glass or iron, recently). Such light bows and arrows are seldom deadly in themselves, but the poison is effective. The Bushmen compound it from the venom sacs of snakes, a poisonous caterpillar, and various poisonous bushes and roots, cooking the whole thing down to a waxy jelly into which the arrowheads, of whatever kind, are dipped. The poison does not work immediately, but acts according to the size of the animal and the nature of the wound. It will kill off a small antelope promptly but take a number of hours to a large one, which might have to be chased a long distance by the hunter.

Now we come to a difference between our idea of hunting and Bushman's. We are ridiculously poor woodsmen. Here at home a hunter goes crashing through the woods until he blunders onto some animal or bird which did not realize that the hunting season has started, and opens fire, either killing the game dead, or wounding it and losing it, or frightening it into the next county; if he kills it he usually has to ask a dog to find the body for him. Our more fortunate nimrod may go on an African safari: practical resident hunters locate an animal for him, which he dispatches with a rifle almost good enough to stop a tank. But a Bushman's weapons, poison and all, are far less lethal, both for distance and for striking power, and along with his weapons he carries into the scales his own vast training and skill, which are impressive.

In the first place, he is highly educated. He knows all about the animals he is dealing with, and how they will act, and how to overcome them. And he has learned how to get the last scrap of information from everything around him, in a way to make Sherlock Holmes seem purblind. We look about the empty landscape and see nothing; to him it is as full of signs as the subway. Not having gone through the same lifelong training, it is probable that we cannot even conceive how differently the same things

look to him. He simply sees through the camouflage. He points off to nothing on the horizon and says, "The zebra." We look in the same direction, expecting perhaps a tiny version of what we know a zebra looks like, and see it. Nor does he; he has seen something which does not look like a zebra at all, but which he knows is a zebra, or was once by a zebra, far away. Nearer at hand, he can follow a given track from its tracks, or from lesser indications, and tell if it is well made and how badly, and keep on this particular track for any distance, no matter how great a tangle of other tracks it may pass through.

Such abilities, though verging on the incredible, are nevertheless commonplace, and turn up among other people dependent on hunting. The natives of Australia are equally well known for such feats. And here is a story from Tierra del Fuego. Lucas Bridges, born and raised on Beagle Channel himself, recommended a sixteen-year-old Ona Indian to the Argentine governor of the town of Ushuaia to help track a convict escaped from the prison there. Since a major activity of the place was cutting firewood and timber in the woods all around, and dragging it with oxen, the state of the ground about the town can be imagined with the trappings of oxen and hundreds of convicts, soldiers and civilians. The Ona boy was shown a picture of the fugitive and a pair of his shoes (obviously not the ones he had escaped in), given a few details of height and weight, and set to work. Little was seen of the Ona except at mealtimes for a number of days, and nothing learned from him, as he hardly spoke Spanish anyhow. Just as the governor, suspicious from the first, had decided that his detective was goldbricking and getting fat on his food, the boy seemed to confirm this by disappearing after a week. But he came back in a week and made his full report very briefly, as follows: "He didn't escape at all." And the prison was accidentally found that same evening hiding in the woods just outside the prison itself. The Ona had made his examination not only of the environs of the town but also of the trails to two settlements fifteen miles to the east and west, and he had satiated his

part of the myriad tracks had been made by one particular animal whom he had never even seen.

He goes back to South Africa. The Bushman hunter's great problem is to make contact with his quarry and keep it, while he can, until he can to end its life with his venomous but rather slow arrow. He must discover it. He must approach it, using every advantage and infinite, wary patience to avoid being discovered by trying either to keep out of sight and smell entirely or to run like some harmless fellow beast idly moving about in the savanna. He tries finally to shoot as quietly as he can: the wound must not even make the animal bolt and the hunter, like a good chess player, may keep things set up for another shot, at the same animal or a different one, leaving them in doubt as to which animal to run off in or whether to run at all. He may actually dress himself as an animal, crouching under a rig that shows him only two legs and makes him look like an ostrich. (One of the Bushman paintings shows a man wearing antlers, who may have been doing the same kind of stalking.) In any case it pays well to get as close as he can before shooting.

A wounded animal is apt to make off, at a speed, of course, far greater than man's. Now the Bushman must track it and keep up with it, even if this takes two days and forty miles. For the Bushman hunter can outlast his game whether it is badly wounded, unaffected by poison, or not. And to show how important are Bushman skill and endurance in this kind of hunting: a Bushman can actually chase down and kill an unwounded springbok, running on its trail, giving it no rest, in the heat particularly, until the sand on the hot sand makes its hoofs give out and it is too tired to move.

There is the spectacular side of hunting, but the Bushmen have other resources. They use dogs in the hunt as well. They trap, pitfalls, deadfalls and snares. They spear fish in rivers, catch them. And they may cleverly conceal a waterhole with stones, holding off water in a channel to make a false hole, they poison so as to kill animals who come to drink.

Look at the rest of Bushman culture you will not see a

at all deal. Dress may start with a headband which is most likely to be a decoration for women and something to stick small pebbles and arrowpoints in for men. Then there is a long gap to a pair of small fore-and-aft aprons for women, or a leather belt for men. Bushmen also wear skin capes, if the weather is cool, or to carry the baby. Their houses, when they use them at all (instead of a rock shelter or a windbreak), are temporary huts made of branches stuck in the ground and covered with grass, grass mats or skins.

For the Bushmen are not settled, and when they move they take everything with them: the man takes his weapons and the woman everything else—baby, extra skins, fire sticks, ostrich-eggshell bottles of water, and perhaps some poor pottery. Their food would keep only a day or so even if they wanted to store it, and we have seen their idea of the proper place for food: in the stomach.

So personal property is not a matter of moment to them. But they have one clear notion of property, which is their territory and the resources in it. Infringement of this is a direct threat to life, and so they are fiercely territorial, like the howling monkeys whose wanderings of each band take place in its own private region, which it would fight to preserve. And they are careful, in the desert, to keep their springs of water their own secret.

Bushman social life is simple. Bands consist of a few families only, which might not always stick together within their territory. And, except for the head of the family, there is hardly anyone to call a chief. For a wedding, there might be a feast but there might, as is usual among hunting peoples, be not the slightest formality. Boy and girl may simply start keeping house and raising children, and if a man can manage more than one wife, he wants to, he may. However, this is lack of ceremony rather than a lack of meaning, for kin relationships are clearly denoted and in every human society, incestuous unions are unthinkable. And a man and his mother-in-law most carefully avoid any recognition of one another. But, though members of different bands might marry, and so have relationships outside, the social universe of a

man is his own small group, which lives and hunts in its own land, and keeps itself happy with dancing, singing and storytelling at night. Religion? Almost non-existent: they reverence the sun and the praying mantis in particular, believe in omens and their "superstitions," use hunting magic, and think diseases are caused by little yellow evil spirits entering the body. But in ceremonies of any consequence they are lacking.

Complicated relatives in Australia

The native blackfellows of Australia, off in another end of the world's land, live a life similar to the Bushmen's, on similar resources. That is to say, their contacts with nature and their cultural defenses are much the same, and they wander in small bands within definite hunting territories. But the African Bushmen, like most such primitive hunters, have no social organization to speak of except a family and a group of families, while the Australian natives have developed some social ideas—it must be admitted that they are exceptionally complicated—which serve them both as a diplomatic structure and as a sort of philosophy.

This is the Australian kinship system. Compare our relatives. "Mother" and "Father" are each a single person. But "Brother" or "Grandmother" can be one of two or more people; "Uncle" can be my brother or brother-in-law of either parent, and in practice it does not even have to be related; "Cousin" has less meaning yet. The Australians are more specific: they will have a name which means "Father's Sister's Daughter" as distinct from "Mother's Father's Daughter" (both are "Cousin" to us), or even "Father's Father's Sister's Son's Daughter." They are also more general: Father's Brother is accepted, socially, as another Father, not simply an uncle, and so this "Father's" sons and daughters are your "Brothers" and "Sisters," not just cousins. And so Father (real Father) himself has a lot of "Brothers" by this rule (who are not real brothers to him), who are therefore also your "Fathers," and whose sons and daughters are also your "Brothers."

and "Sisters," until you think you must be in the Hall of Mirrors here. Does it sound complicated? It is, and more so, though we know that terms are linked together, and where they repeat themselves. This does not mean the Australian natives post such a chart to keep themselves straight, or even that they conceive of such a chart. It only means that they know what names to call, and by, and it also means that this kind of relationship can be carried far afield into other bands, or even tribal groups, if necessary.

For their marriages are enmeshed in this system. A man may not marry his sister, naturally, and in fact in many tribes he will use the most profoundly correct behavior and language when they are together. And of course it would also be incestuous to marry any of his other "Sisters," no matter how distant in actual consanguinity they may be. On the other hand, there is in fact a preferred marriage for him: his Mother's Brother's Daughter who, though his true first cousin on this side, is not classed as his sister, but rather as "Expected Wife." His Mother's Brother is not "Father," but "Father-in-law." Actually, of course, it is likely that there is a Mother's Brother's Daughter available for him, because the whole system cannot be expected to have the right numbers of people in every pigeonhole. But there will nevertheless be girls who would be the Expected Wife's "Sisters" if she existed, and by the system of classification they are therefore "Expected Wives," in extension, to the man in question. If he should marry more than once, his wives would always have this kind of relation to his children. The practical result of all this is that people fall into classes which determine whom they can and cannot marry, and whom their children can and cannot marry. (The system I have described is not the universal one in Australia; some are more complicated elsewhere, perhaps among the very early Greeks.)

Actually, regulation of marriage is only one side of this. After all, such an overgrown blueprint would be an odd development if it existed only as a guide to betrothals. Instead, it places every man in some kind of stated relation to yourself, and tells you how

wird them, and what to expect from them in return. You know perfectly well which are your true parents, brothers, and so on. But your behavior toward other, distant "Fathers" is a dilution of what you use toward your own father or his real brothers. This is how the system stretches beyond the horizon, so that you can always go among other bands—a great consideration—establishing relationships with people who are strangers, by finding some sort, if necessary, assuming one. That is what I mean by speaking about a diplomatic structure. Extensive relationships and channels for contact exist which make travel, trade and intermarriage all easier, countering the natural isolation of separate bands. So it is a matter of lives and security, not etiquette alone. The Australians take a like view of nature in general, and thus see themselves kindred to the universe as well as to one another. They are the world's great totemists. Ancestor-heroes lived in the dream-time when everything was being laid out the way it is today; these legends are the blackfellows' Bible, and their rituals are dance-dramas which bring the dream-time once more into life, revivifying both nature and man. From the ancestors sprung both men and animals, so that kangaroo totem spirits may be born today either as kangaroos or as men of the kangaroo totem, who must never eat the flesh of a kangaroo. Not only this, but marriage classes and other groupings also have totems, and these run throughout nature, so that the Australians in effect name things by totems. The very features of the landscape were made by the heroes: a certain rock may be the bones of one, a red ochre deposit be blood shed by another, and they know all the sacred trails by which the ancestors traveled.

So the barren bush country is not only the band's vital hunting ground, practically speaking aloud to the natives (as it does to the South African Bushmen): it is also a landscape of the spirit, in which they are a part, body and soul. It is their ancestral home, where their particular totem spirits are lodged. Here, they are in touch with nature, and by their religious rites they know how to do that way, causing the animal spirits to be born, and so make

the game plentiful. Away from home they feel less unhappy and unsafe.

Except for this social (and religious) organization life is simple. Bands number something like twenty-five to fifty families—and if there is anything to be done men get together and decide it. Occasionally a number of bands meet for a ceremony; these larger groups are called "tribes" only in the sense of having a common language and more or less identical customs.

Such a ceremony might be an initiation of the boys into manhood. This is a universal item of culture, and is particularly noticeable among the simplest people of all. It consists, typically, of not letting the boys live by themselves in the bush, under certain restrictions especially as to food; of wounding, hazing or torturing them, and of teaching them moral precepts and some secret knowledge, with the adult males of the group performing the ceremony or dressing up as supernatural beings. The Bushmen of South Africa do much the same things. In Australia the boys learn the lore of the totem ancestors which they have known from them before, and never known to the women. At the same time, too, they undergo circumcision or some other punishment such as having a tooth or so knocked out. Now whether or not these customs of initiation have been thought of with any intent (which is not likely), they serve as a dramatic introduction to adulthood, shocking the youth into respect for the responsibilities of manhood. At the same time, he becomes aware of the responsibilities of being a hunter, since among the hunting peoples being a hunter is a painfully obvious part of the whole ritual.

The outlines of Australian economy are presented by the South African Bushmen. Small groups travel about in camp, looking for game. Shelter and dress are simple. In the south of the continent, where the cold nights are severe, they make log huts or to wear a skin instead of a coat, and a fur string around the waist or the head. They have no

the platypus and the opossum (there were some typical mammals except the wild dingo among, which may first have arrived with the men). But, like the Bushmen, they have a long list of plants. The women dig up wild yams and other tubers while the men hunt. Their goods, such as they are, form a Mesolithic inventory. Spears and spearheads, bows and arrows, Boomerangs (the great Australian invention), clubs (not meant to return, but to stun or kill birds, and I was for fun only), Nets for birding and fishing, and cords. Canoes in some regions where rivers are wide. The stonework contains many of the styles and motifs of the whole Paleolithic. The natives must have come from elsewhere, and may have certainly been isolated in Australia for thousands of years (perhaps much longer), but just whence they do not know.

Hunting culture and hunting society

The Aborigines, like the Bushmen, are simple foragers, using complicated weapons with enormous skill in hunting. Hunting is an accomplishment out of eating or not eating. They are few other hunting-gathering peoples of the world who can see in many of the main aspects of their culture as we duplicate themselves in our account. This applies to all of them, and their culture are all alike, or on one level. We find the same difference between Bushman and Australian social organization as we find in the difference in their weapons. The weak bows and arrows contrast with long bows, some of them over ten feet long, and the complicated manufacture of arrows, such as those of certain Bolivia, or with the S-shaped blowpipes of the Pataxos, or with the blowguns of the Sakai of Brazil. All of these involve a lot of special instruction and they are not simple tools at all. Both the Bushmen and the Australians live in

HUNTERS—THE FIRST STEP

Not too disparate in nature, other hunters may have very different environments and ways of coping with the same basic problem. Some have a wide variety of opportunity, as in Tierra del Fuego where the Ona Indians hunt on land with the bow and arrow and their next-door neighbors, the Yahgans, prefer spears and bows. Some hunt on land and in canoes, depending largely on mus-
tard seeds. Some are highly special in their pursuits, like the Carib Indians of northern Canada. Some are more generalists than hunters, like certain of the Indians of the western United States and Lower California, where nuts and vegetables of all kinds were staple foods.

The behavior of the hunters has similarities everywhere. There are even examples already: the common obligation to give a part of your kill (the same obligation to share food that you would impose on people in a lifeboat); the gluttonous eating when food is plentiful; and the great sharpening up of hunting skill. Social life as well has such similarities. Now nothing is a greater mistake than to jump in and find general "rules" in culture or in history or in hunting though it is. The next minute you are talking about the "end" in the "evolution" of "marriage," as though marriage were a species of rabbit. Nevertheless, it is not hard to see that the very circumstances of hunting life must logically mold societies to certain main patterns.

Perhaps you once had a picture of all these savages as ferocious, lustful, unrestrained, indiscriminately filthy, grunting gutteral, near to animals in their senses and desires and near to children in their emotions and intelligence. This is entirely unjust, both to them and to a sensible understanding of humanity and culture. The savages are profoundly uncivilized, make no mistake about that, and they are the lowest in the scale of known societies. But do not forget that they represent the end of the Stone Age, not the beginning.

Of course there is much in their visible life to support a poor opinion. If cleanliness is next to godliness, let us not think what they are next to and you are certainly not obliged to like the sight of them gobbling rotten meat or kangaroo intestines. You will

be excused for taking umbrage if you should suddenly perceive an arrow shaft protruding from your front and back when you thought you were minding your own business. For they put little stock in strangers, or anyone outside their own group as they meet it.

But let this not create an impression of wanton bestiality, brutality and stupidity. Our hunters are perfectly clear about right and wrong within their own bands, and are just as responsive to the restraints and regulations of their own cultures as we are to ours. They are not natural-born killers. Cannibalism is practically unknown among these hungriest of men (except for instances of surgical nibbling), and the Bushmen will not even eat the baboon, because he is so like a man. Head-hunting is also unknown, both this and cannibalism being ornaments of higher cultures (although some of our own Mesolithic ancestors in Europe did hunt heads and Pekin Man, of course, ate Pekin men). Marriage regulations are carefully observed, and the rule of avoidance between a woman's husband and her mother (a kind of etiquette which emphasizes the importance of relationships and forestalls dangerous frictions) is widespread. Orgies of sexual license, which may take place periodically at large gatherings, are understood as just that, and approved for the occasion only. And the harsh discipline of initiation rites is not sadism on the part of the elders. On the contrary, it exists to enhance personal restraint and responsibility, traits which we consider civilized.

Nor are such people merely one step away from apes in their cultural existence. I have said that their economy—simple gathering—is essentially that of apes, and so it is. But human hunters are an acren away from apes, because they are human and have culture. The poverty of the culture makes the human abilities stand out, such as the endurance, the variegated feeding, and the intelligence required by the incredible feats of tracking. These abilities show us what a dangerous, resourceful animal a man can be standing alone with his bare hands. But all the lore and skill (which is not mere "animal cunning") is actually culture in itself, just as are the weapons, or the co-operation in hunting and in

eating. Bad as it is, this little culture allowed Mesopotamians to conquer the whole world; there is no other large animal that can live in all the same places as man, and even his dog somehow depends on him utterly.

Also, the social culture of hunters is not really rudimentary more than their languages. It may be simple. But the point is that it constitutes true, fully fledged cultural behavior, and that the hunters are capable of using more complicated techniques and institutions if they need to. Hark back to the howling of the dogs. They learn to do various things like riding on a mather's back, and above all to live peaceably with the members of their own band, but the rest of their actions are largely instinctive. The rate the hostility between bands is unvarying, and their regard from one another is complete. Human bands may be suspicious territorial, and jealous of their hunting grounds. The Ona Indians, for example, are not good mixers, being too willing to shoot down men of other groups and steal their wives from them (though this is not the ordinary means of getting wives). But the Australians have a kinship scheme for regulating relations between bands by establishing a kind of "communication" they would not dream of from their everyday pursuits. So cultural means of this kind are available, which the Australians use and the Onas do not. And these societies subscribe to the rule against incest, and this, too, without social contacts. If a man marries his sister he loses the chance of marrying himself with a new family, and the band loses an important element in the interweaving of its members. These considerations are much more important in higher societies, but of no less consequence even here.

So the last of the hunting peoples are an extraordinary lesson. Certainly they are more to be pitied than to be envied. See them struggling against the limits of a purely natural environment and the necessary isolation of small groups. This is us man—modern man—caught in the toils of a way of life inferior to what his brain and his psychological nature have since made him capable of.

9 *The first food growers: the Neolithic*

With the end of the Ice Age the hunting peoples were moving into every part of the habitable world, except the outer islands of the Pacific and perhaps such poor places as Greenland and Baffin Land. For a time they even roamed the plain between Scandinavia and Denmark which now lies under the North Sea. Making the most of nature, they discovered every kind of available food, including those which have to be specially treated to be edible like acorns. And in different places they gave themselves the benefit of many fairly intricate inventions, whether weapons or hunting tricks, even though typically they could carry their stone cultures around as they traveled, in their heads or on top of them.

Then, about 6000 B.C., and somewhere in the Near East (as far as we know), the Neolithic way of life began. It is still called "Neolithic" (New Stone Age, as Mesolithic means Middle, and Palaeolithic means Old Stone Age), because the older anthropologists saw everything in the light of stonework, and thought of this "period" as the age of polished stone axes. But it means, rather, a state of culture in which food is planted and bred, not hunted and gathered—in which food is domesticated, not wild. It is hard to choose the greatest single change in human history up to the present, this would be it. I mean, of course, a really cultural evolution, as distinct from a biological change by breeding erect, or gradually becoming able to use culture changes in the first place. And I do not mean that the change was sudden, or dramatic to those who were changing, as though culture were being switched on. It was dramatic, but long after,

THE NEW FARMERS—THE SECOND STEP

In consequence, because everything else we have achieved has come out of this as a beginning.

By about 4000 B.C. there were farming villages spread widely across the Near East, all the way from the Faiyum Basin in Egypt (up the Nile from Cairo and the Pyramids), through Palestine and Syria, over to Iraq and Iran. They were not all the same in every way, but a summary picture of their culture was something like this. The people lived in houses, of mud brick or mud with brush walls. They grew wheat and barley; they cut the grass with straight sickles made by setting flint blades in a row in a



Basket and hand mill of the Neolithic

piece of wood or bone; they stored it (in some places) in granaries or pits lined with basketry; and they ground it for bread in early hand mills of stone, or in some other kind of grindstone grinder. They raised cattle, sheep, goats and pigs (and dogs, which remember that a dog is a Mesolithic contraption used for hunting, and not a barnyard animal). But they also hunted wild animals, and took birds and fish, especially in the Faiyum, to round out their diets. They made bowls and jars of pottery. And they wove linen cloth out of flax.

This is a culture which, emphatically, you would not try to live in, and on your head, even forgetting the houses and grain storage. Its origins have not been pinpointed, but they must have come from the same part of the world, the Near East. There were

have been Mesolithic hunters in the area down to nearly 6000 B.C., according to radiocarbon dates.¹ And one of the earliest villages of farmers yet discovered must have been founded by 5000 B.C. or earlier; this was already a full-fledged village, so that the formative period must have been some time prior to this. In fact, during such a formative period, it is easy to suppose that farmers might leave their village, which we recognize as "Neolithic," and go off on a hunting expedition during which they left remains in a cave which we would dig up and label "Mesolithic."

This early village, called Jarmo,² is in the hill country of Iraq above the Tigris-Euphrates Valley. It was made up of simple houses of packed mud walls, and lasted long enough so that eight levels could be made out by the excavators. Grains of wheat and barley were found, along with the household tools for making flour, especially hand mills. And there were bones of cattle, sheep, pigs and dogs.

Now it might be hard to prove just what was the state of domestication of these animals, but here at any rate was the basic domestic livestock in a group; and all wild animal bones—i.e., those which were clearly products of the hunt—amounted to only five per cent of the total. One feature of the houses was burning basins of clay (hearths?), but aside from the remains of these

¹These dates can be determined from surviving vegetable matter or charcoal, and to some extent from animal remains like shell. They depend on Carbon 14, a radioactive isotope of carbon having a half-life of 5568 years, meaning that it decays at a known rate like other radioactive elements. Carbon 14 is in the atmosphere in a definite proportion of all carbon, and so it goes part of all living tissues in the same ratio. When the tissue is dead the Carbon 14 begins to decay, until in about twenty-five thousand years there is too little of it left to measure accurately. So the remaining proportion of Carbon 14 in a fragment of wood or in grains of wheat tells approximately when those objects ceased to live. It is a little like this: a tumbler under a strong faucet stays full; turn off the faucet and the water in the tumbler begins to evaporate until it is gone. While it was evaporating, you could not tell how long ago the faucet was turned off; afterward you would only know that at least the time needed for evaporation had elapsed. For this reason radiocarbon dates can be worked out only within the last twenty-five hundred years or so, and are presently none too precise beyond the last ten

there were no signs of pottery until the highest levels, at the end of the settlement, when some fragments of poor-grade stuff appear. And there were no signs of weaving at all. So here was a group of very early farmers, lacking even the two typical arts of "Neolithic" peoples, pottery and weaving, but with the domesticated grains and animals well in hand.

Something very similar existed in ancient Jericho, in Palestine. Here the oldest levels are probably as old as Jarmo, and may prove to be directly descended from the Mesolithic inhabitants of the region. Yet this very early Jericho had already assumed the form of a true town. Before they were making any pottery, the people had built a town wall of rough stone. And the wall still stands, not thrown down by the trumpets and the Lord; it has been uncovered well beneath the remains of the later Jericho that Joshua fit the battle of.

The beginnings of planting

None of this tells us how the business of domestication came about, and here we have to fall back on a little imagination—but let it be the right kind of imagination, and not one that sees a Mesolithic genius waking up in a hut, exclaiming, "Why didn't I think of that before?" and smartly laying out a garden and planting it full of good things. On the contrary, rapidly though it happened by Paleolithic standards, the deliberate sowing of grain must have come about by accidental steps, at the hands of gatherers.

There is impressive proof that the Mesolithic hunters had come to know and eat every possible kind of natural food, and in the part of the world they surely made use of edible seeds, as in all other parts. Many such people must have anticipated the ripening of wild crops, and perhaps come early to places where they grew, possibly even to pull up weeds or chase birds away. Here in the Near East, in fact, the Natufian people of Palestine seem to have had a very late Mesolithic culture. Yet they had sickles

which is thought to show that they harvested wild grasses and grains on an important scale. Realize also that these cereals, wheat, barley, the millets (grasslike grains including sorghum, very ancient in use), will keep well if they are stored in a proper place, and you have something which emphasizes the importance of that crop and exerts a steady pull back to the place where it grows well, or where an otherwise wandering group keeps its stores of the grain. And suppose that little by little the people try other ways of helping the crop, and camp near it, or carry some grain home to one of their main camps, and accidentally spill it around so that it grows there. Then the final purposeful growing of this kind of food is probably inevitable. Now the whole process might be very slow, or too difficult entirely, for many wild vegetable types, and it is probable that the particular qualities of these grains, like their yearly growth (as opposed to a tree-borne fruit), their high food value, and above all their storability, would have helped the incipient farmers along in their unconscious process of domestication.²

You might think that it would be possible to find the home of all this by finding the natural home of the grains themselves. Unfortunately, the grains grow wild in too many parts of the Near East and northern or eastern Africa to make this possible. And the same thing applies to the animals. This last is especially true because, once the idea of domesticating them had been clearly established and herds had been introduced into new territories, then some of the local wild forms in these new territories may have been brought under domestication, as a way of enlarging the flocks. This seems to have happened with cattle and pigs in Europe, for example. That would tend to make it look as though the original domestication had taken place all over creation, instead of in one principal place. The chances are strong, however, that cattle domestication, like that of wheat

²Professor C. O. Sauer has quite a different hypothesis: that sedentary lake and stream-living fisher people learned to propagate roots and cuttings to duplicate already growing plants—rather than seeds, partly out of lack of fibers for nets, or for fish poison. See p. 194.

and barley and other early plants like flax, happened in the Near East.

It is actually surprising that the main animals—cattle, sheep, goats and pigs—all show up together in the lowest archaeological levels of the oldest village, Jarmo. This is the kind of thing that suggests Neolithic beginnings must have gone back well before Jarmo's founding in about 5000 B.C., and perhaps before 6000 B.C. But in any event it is likely that the grains were domesticated before the animals.

For the essence of village farming life is building a village and living, that is, staying in one place. And it is plants that stay in one place, and so ask the people to do the same, while the animals may wander. If the people are wandering, and living by hunting, they cannot afford the time to care for livestock. Sometimes hunters bring live animals to camp as a way of having the next day's food at hand. But these animals never survive more than a day or so. And a hunter's real reaction to a food animal is to eat it. This was the Bushman's approach to Hottentot or Dutch cattle, and the Sioux Indians did the same thing when the Great White Father was trying to make them settle down and gave them some cows.

But domesticating cattle is not simply stockading them, or even letting them, it means rather causing them to breed successfully while they are dependent on human beings. And this means living at something else while waiting for the animals to reproduce and grow and give milk. Now if you are a hunter, not a farmer, it would seem preposterous to be hunting rabbits or gazelles if you have oxen and sheep at hand, all ready to be killed. Of course we do not know what actually happened in 6000 B.C., and there may have been special circumstances. And also there are the reindeer nomads of Siberia, who give the impression that they are in the very act of bringing the reindeer to heel; but the circumstances are peculiar. On the face of it, it would seem that the domestication of wild cattle would be slow enough and hard enough to suggest strongly that it was done by homesteaders, not hunters.

Now let us look at pottery and weaving, because they both

appeared in the Neolithic villages fairly soon, and because they tell us a little about the nature of Neolithic life.

Pots and looms

Pottery was the first plastic. It has to be made from carefully selected clay, which is made into a paste with water. Before it is shaped, it must be given a temper, in the form of some kind of sand or grit (unless these are present naturally) or even of other things, for two reasons: to keep it from being too gooey to work with at all, and to make it a little porous so that water may leave it in drying or firing without breaking it. When it has been completely dried, it is still only a patty-cake of mud, and must be fired to change its chemical nature. This drives out the water which is still chemically part of the clay, removes animal or vegetable material, and changes the clay itself.

Now it is usable, and completely resistant to water and to ordinary fire. Pottery can be decorated in a number of ways: by shaping; by all sorts of surface markings with sticks, stamps or cords while it is wet; by cutting or scratching after it is dry; by painting or glazing or "slipping" (giving a special finer coating) before it is fired; and various other means. Pots are easy to break, but the pieces last indefinitely, and so the archaeologists love pottery beyond anything else, because they can trace tribes and cultures and periods by styles of potmaking and decoration.

But the people themselves love pottery because it is so useful for storing food, and especially for cooking. Boiling is an important way of making vegetables and grains edible in larger quantities. However, trying to boil in a wooden or bamboo container, or by dropping hot rocks into water in a skin-lined hole in the ground, is something less than perfect. One such substitute is a basket daubed with clay, and it may be that pottery was first invented through the accidental burning of these.

Pottery is by no means simple to make. Like the bow and arrow, it actually consists of a complex of inventions, and so does the weaving of true textiles. Basketry, matting and netting were

Present in Mesolithic (and Paleolithic?) times, and these, when fairly complicated, can be made by hand or with the aid of simple tools like net gauges. Actually, if you want to tie a cord between two uprights, and hang the warp threads from the cord you can do the in-and-out weaving of the weft threads with your fingers. You can also do long division with your fingers, but there are better ways.

You can suspend the warp threads from a stiff bar, and hang weights to the bottom of groups of them, which will give you some tension on the threads and ease the threading of the weft into them. You can have bars top and bottom, making a real frame and enabling you to roll up the finished cloth as you work. You can use a comb to push the last weft thread tight against the previous one. You can tie every other warp thread to a stick, called a heddle, so that when you lift the stick in one motion you create a shed between the right warp threads, and can throw the bobbin through in a single stroke instead of having to weave the weft thread painfully over or under one warp thread at a time. Here you have a fully developed hand loom, out of which we today have simply made a machine; Neolithic peoples carried things up to this point. In fact, just as all our edible plants and animals were domesticated in Neolithic times, so were all the basic techniques of weaving discovered.

Weaving needs fibers, of course, which were found in flax and later in cotton and wool (the hairy coat of wild sheep is much less suitable for spinning into thread, and the woollier coat developed under domestication). Thus it depends to no small extent on Neolithic resources, while it furnishes a superior replacement for the skins used by most of the hunters. But more than that, weaving, like pottery, marks the accumulation of new kinds of household gear of a non-portable kind. Looms are not for traveling, nor are pots. Instead, they signal the arrival of sedentary life, which is a central fact of the Neolithic achievement.

It must be said that some hunters, like the Bushmen, make or buy pottery, and that pottery was used by late Mesolithic people in Europe, central Africa, eastern Asia and North America. Whether pottery actually existed somewhere before the first domestication of plants is not known for certain.

The meaning of farming

This brings us, in short, to the meaning of the so-called Neolithic revolution. If you generalize, and take the typical effects of culture of hunting life on the one hand and of farming life on the other, you can see that something stupendous took place. As in the case of the appearance of culture itself, it was a breaking of one of nature's bonds, the freeing of man from the limits of the natural supply of food.

You have seen simple hunter-gatherers at work. They have a few crude ideas about conservation and some, like the Australians and the Magdalenians, exerted themselves in pious rites to make the game more plentiful. But that is wishful thinking; nature is in control, not they. Nature goads them about from spot to spot like howling monkeys, and there is nothing they can do about it. They cannot stockpile their food: when they have eaten, it is high time to start thinking about the next meal. Around any camp there are only so many wild animals and so many edible plants, because of the balance of nature. When these have been hunted or picked beyond a given point, the supply becomes too short and cannot recover, perhaps, for that season. What do the people in the camp do? They pick up and move on, to a place where the game is untouched. So this band must have enough territory to keep rebuilding the supply, it must preserve the supply against poachers, and it must move, move, move.

What about the numbers of people? Since they are actually part of the balance of nature themselves, they will be limited to a number which their territory can support in its worst (not best) years. So the whole human population must be relatively sparse and spread out.

And the size of the band? Actually the simplest family can get by on this kind of a life, the man to hunt and the woman to root vegetables, insects, water and firewood and to tend to

odd jobs. But this leaves them with no help if they have no men, and while larger groups may not only protect themselves better, but hunt more effectively, whether by co-operating in a rabbit drive or by multiplying the chances of finding and killing a large animal on which all can feed. However, the size of the band soon reaches a point at which it presses too hard on the food supply. There will simply not be enough food within their radius of action around the camp, or the band itself will not be able to move far enough and far enough to tap the resources it needs. Only once in a while can bands come together in tribal meetings, and then perhaps when a natural crop—a cactus pear or a kind of grub—comes into season, and for a while creates plenty for everybody. The rest of the time the bands must keep their distance, and the number of each will be something like fifty souls, more or less.

These laws of nature have teeth in them: many such people accept the necessity of killing some of their infants at birth because the mother already has all the young children she can cope with on the march; and most of them ruthlessly abandon the sick or the helplessly old to freeze or starve. If, rarely, they put forth efforts on the aged one's behalf, these efforts are usually strenuous. Such action is not subhuman callousness. Even though they may appear to take it calmly, the people have no choice at all in what they do, or even the face they put upon it.

We see, in fact, human beings like ourselves trapped, without knowing it, in a life which prevents them from having larger material inventions and social combinations. Small nomadic bands can hardly become civilized if they cannot even set up substantial households. They must find some escape from nomadism but not from isolation and the limits of small numbers. They can find some escape from the tread-mill of food-getting, which has them almost always either hunting or getting ready to hunt, and so keeps them from having any specialization of their energies, and makes the only division of labor that between the animal-hunting man and the plant-hunting woman. This escape was found with domestication, when the ordinary balance of nature

broken and food was made to grow not by nature but by man. Camps changed to villages, and dozens of people to hundreds.

But the millennium did not arrive with a rush. This was the case change, ideally, but it was gradual, and there has always been a lot of overlapping. The Siriono Indians, nomadic hunters of eastern Bolivia, are normally so hungry that their conversation is largely about food, or squabbling over food, or begging one another for food (they are perhaps the least honorable of the Indians, and will eat in the middle of the night to avoid sharing). And yet they plant small plots of corn and other vegetables around the house or at some place near which they expect to be living; still the corn patch fails to rescue them from their hard lives. Many Neolithic peoples hunt and fish avidly and, as we shall see, the more primitive ones cannot even remain long in one place because of the inefficiency of their methods of farming. Even in archaeology we can see the gradual nature of the development.

Peasants on the Danube

After the still undiscovered origins of the Neolithic farming villages were established all over the Near East. More slowly, as the new ideas seeped westward into the European forests, the Mesolithic people there began to practice the new arts. Very gradually makes its appearance in the shell heaps of Scandinavia (of the mainly Mesolithic Ertebølle culture), and then in the French Campignian are found occasionally the bones of the domestic animals. These partly Neolithic settlements more and more begin making stone axes, of the Mesolithic type, but with polished rather than chipped cutting edges. Such polished axes are considerably more effective in cutting wood, because they break less easily and have a cleaner, deeper bite; and they show that wood-working was coming into its own, for clearing land and for making houses. The polishing of stone tools, and indeed the skillful chip-

ping also, later became a striking feature of the European Neolithic.

But the early phases of the period were distinctly backwoods, doubtless the result of a few contacts by immigrants and trade. The major colonization of Europe came later, with the Danubians, so called because they advanced up the Danube from the southeast corner of the continent. This was about 2700 B.C., when Egypt had already entered its great period and was building pyramids. The Danubians might have come from Turkey, and they might have come from southern Russia. They made good pottery, first decorated with meandering shallow grooves and later by other markings. In fact, because of this new kind of evidence, archaeologists can almost study their migrations tribe by tribe.

They came with grain agriculture, and with the animals of the original Neolithic center of southwestern Asia. Pigs were important and useful because they could do well in the forests of the time, and so could cattle. Sheep, on the other hand, prefer open country, and only came into their own later on. In Germany and Poland the Danubians built good-sized villages of well-made rectangular houses, with timber or mud-plastered walls and thatched roofs, and apparently with wooden floors supported on posts. These were large houses, up to 100 feet in length, and for some reason certain villages made them broader at one end than at the other. Better houses than these were not made in Europe for a very long time.

However, all was not peaches and cream for the Danubian farmers. They had no plows; instead, their gardening was of a primitive kind which goes under various names: the geographers call it milpa agriculture, and the anthropologists call it slash-and-burn. It is used today in places, and was very common in pioneer America. Trees are cut down, or ringed and allowed to die; then wood and brush are burned over, with no clearing of stumps; and the natural soil, slightly enriched by ashes, is turned up with hoes or sticks (the Danubians had stone "shoe last" hoe heads), and the seeding is done all around between stumps.

There is no manuring or other treatment. This gives a good soil but wastes it quickly, so that a new patch must be cleared after a crop or two, and the old one is ruined until a second growth of trees has come along, years later. So the Danubians, like others, ended by using up all the virgin forest around them, after which



Early Danubian pot

they could only move along to a new place. Thus they had villages but not cities; like the hunters, they still had to move, if only once a generation.

Furthermore, the grains are hungry plants, using up the soil quickly. Hence the Danubians moved rapidly, settling in much of the middle of Europe. They came up, choosing the not too heavy mixed oak forest, which grew on the areas of fine loess soil good for the browsing of cattle and pigs, and easiest to work with a simple hoe. They followed this soil until they got as far as the Rhine and Meuse valleys. But as the Neolithic people spread in Europe they were forced into the rest of the deciduous woods (the northern evergreen forest was altogether too poor for their kind of farming), and things were harder.

Soils were more difficult to work, and keeping stock was a serious problem in fodder. For Europe was not open meadows. In spite of the farmers' inroads the forest grew up again on the wasted soil, and it was only the steel axe in the Middle Ages that finally pushed back the woods for good and all.

The Swiss Lake Dwellers

In 1853, in an unusually severe drought, the lakes of Switzerland fell well below their normal levels and exposed the stumps of ancient posts, clustered in many places near the shores. Thus were discovered the several hundred villages of the famous Swiss Lake Dwellers, who first began to build them in Neolithic times not long before 2000 B.C. They went on through the Bronze Age, but the earlier ones give us a wonderful account of the life here during the last part of the Neolithic, when the culture was widespread in Europe. For the people built their houses on piles out over the water, with gangways to and around them; and great amounts of their goods fell into the water and were preserved in the mud, capped by such fortunate occurrences as fires and drownings. In this way objects of wood, charred food, weaving, netting and matting, and so forth have survived which would largely have decayed in the refuse of a dry-land village. So we see what a variety of household goods they had, in the form of wooden bowls and combs and many other things, as well as the usual stone grinding mills. We see how many different techniques of weaving cloth they knew. And we discover how they put their tools together—how they hafted their stone axes, for example, with a socket of tough antler between the stone and the wooden handle, to resist splitting.

But it is not quite clear why the people lived over the water. Pile dwellings were also being built elsewhere on dry land, so there is nothing mysterious or special about the culture itself. Perhaps they were less bothered by insects, vermin and trash. They do not seem to have been great fishermen, although they

did catch many ducks, as well as other water and land birds; and they hunted elk and wild oxen. They had the usual farm animals, as well as flax, wheat and barley (no oats or rye in the Neolithic villages).

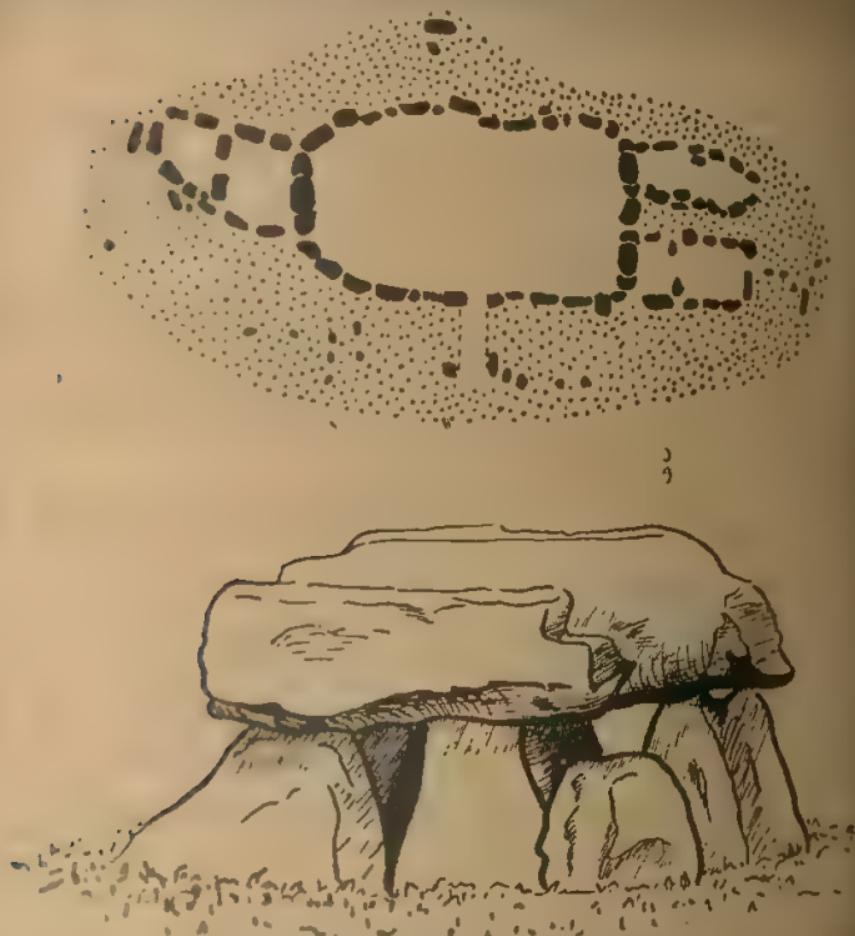
By now most of Europe was populated by farmers, either immigrants from the East or missionized Mesolithic people. Only in the north did a Mesolithic way of life persist, where farmers could not yet make a living.

The megalith makers

The immigrants had come in various ways, and not only up the Danube. One of the latest Neolithic manifestations, or streams of culture, was also the most peculiar, that of the megalith makers. It seems to have started in the Mediterranean, or because of some influence from the Mediterranean, and perhaps had a connection with pyramid and tomb ideas which were by now already old in Egypt. It spread up the Atlantic coast of Europe and had its greatest impact on France, the British Isles and Scandinavia.

The Megalithic people constructed monuments of huge rough stone which nowadays go by the name of dolmen, menhir, pierre levée, giant's tomb, passage grave, horned cairn, long barrow and so forth. Some of them are nothing but a sort of crude archway, two vertical stones capped by a third, each weighing many tons. Others have chambers behind the arch, sometimes with a skeleton or two buried in them. Still others have a long passage or even a sort of courtyard in front of door and chamber, suggesting that they were used for rites, perhaps over a period of time, and perhaps associated with the dead. They were generally finally covered over with rocks and earth, to make an oval barrow or tumulus.

The most unusual megaliths are the long rows of single great standing stones at Carnac, in Brittany, and some of the stone circles of England. Nobody knows what went on around any of these things, and you can paint your own picture of the doings.



A dolmen with capstones in place, and (above) the plan of a large mound in Ireland with a court and several chambers

But the fact remains that a cult of great appeal had seized on the Megalithic people, because the structures must have called for a good deal of human labor (such as hunters could never have afforded, you notice), as well as for the building of earth ramps to place stones in position or to set capstones, and for various engineering tricks like the use of rollers.

All this was happening about 2000 B.C. and shortly after, in an age which seems vastly remote from ours in culture as well as time. Although diminishing areas long kept up an almost Neolithic way of life, Europe as a whole grew apart in later times from its alma mater, the Near East, as both of them attained high culture. Furthermore, Europe was not the only direction

out of Southwest Asia in which the Neolithic culture spread. It pushed southeastward into Afghanistan and western India, though we still know very little about this. It reached all the way across Asia to the original northern home of the Chinese, where farmers raising cattle and pigs, wheat and millet from early times give evidence of this ancient and remote linkage with the Near East.

North Africa: a Neolithic souvenir

One other prong of the Neolithic spread was south of the Mediterranean, rather than through it or north of it. This moved across Egypt and along the riviera-like northern shore of Africa. Even in late Paleolithic times North Africa had had connections with Europe rather than with the rest of Africa, especially racially—the basic population is White, with many blonds—and the loose kinship continued in their common Neolithic colonization from the East. The ancient Berbers have been Mohammedanized by Arab incursions, and they now read the Koran, and use guns, plows and other post-Neolithic inventions. But they cannot even smelt their own ores, so that one can say they are not technically living in a metal age. And the more backward of them probably preserve the Neolithic village life of the Near East fairly well, or at least as well as any people living.

They are found in fairly rugged country in the Rif and Algeria, in good-sized villages, made of stone and clay houses with wooden doors. Some houses have two stories, but these are somewhat collapsible. They do not move their towns, however; their gardening is broad enough, and their land well enough irrigated, to support them in one place. They are mixed farmers—very mixed. Their cattle, cared for as well as they can manage, and used for milk, meat and hides, are nevertheless runty, and goats and sheep are important. They are Moslems, in a nominal sort of way, and it will not be tactful to consider whether they ever eat pigs;

they will not discuss the matter, but things looking very much like pigs are apparently kept by some of them. They have the usual grains, including rye, which will grow on poor hillsides, and cereals which they can gather wild. Along with this familiar pattern they grow various garden vegetables, and, more important than that, are orchardists of no small means, raising olives, figs, nuts, oranges, lemons, apples, pears, plums, peaches and apricots. On top of this they use much wild food, which they speak about as their oldest foods of all: wild olives, acorns, cherries, mulberries, asparagus, celery, mushrooms and so forth.

So they serve to remind us that, in the Neolithic proper, the people of the Near East (if not of Europe) doubtless had broader food resources than we can always detect from archaeology. They also show us at once how much more complex social life may become in large villages than in the bands of hunting peoples. Later on we shall see how varied its forms may be. Probably the Riffians' customs are more familiar to us than are those of other cultures. For example, like the hunters, they reinforce their food-getting and its distribution with certain practices: they have sharecroppers, and harvesting bees, and regular charitable institutions. Gleaning is allowed (see Ruth 2), and in fact any hungry person passing a man working in his garden can hop over the fence, pitch in and help, and the gardener will owe him a meal.

Their towns are made up, not so much of families of our style, or by anything like the fearsome organizational schemes of the Australians, but of extended families consisting of the actual households of a group of brothers. They call this large family a "vein," in the Rif, and the vein decides such matters as buying and selling. A group of such big families will make up a "bone" which may be either the same thing as the whole village or a major part of it; a sort of superfamily with a council to decide its affairs. Over this there are councils of whole districts and finally of tribes. (In the Kabyle region of Algeria they have instead local parliaments.)

With all of this they have a highly developed code of the

own laws, and also a strong code of honor. In other words, in our own best traditions they love to argue and they love to fight. They are great cracker-barrel lawyers, and councils meet to settle affairs with every anticipation and wish for an orderly settlement, but the admired legal process is only too apt to lead to an increase in the temperature and finally to a pitched gun battle between opposing bones, with dead and wounded all over the town.

We can gaze far back into the past at the skull of a Neanderthal man. White men, too, have been here before us. We find their bones in the caves of the Neanderthal period, and we find the remains of farming in the Near East, which was the first home of agriculture. We find the traces of successive waves of people, all White, moving southward from the north and northwest into the Europe of the Neolithic period.

If only we had an ethnographic map of Europe, we should be pleased indeed! Let us suppose that we had such a map, and let us consider the fact in order to view what has happened in Europe since the time of the Paleolithic. We find ourselves in the presence of the modern world that has come into being, and that has at many places by degrees replaced the Neolithic world. The modern varieties of man, the descendants of those who have themselves about Neolithic times, are now the principal inhabitants of Europe. They have been transported by their migrations over long distances (and, for example) and have become neighbors to one another, neighbor to neighbor.

Races, of course, are not the only factor in this picture. Far back of the Neolithic period there is another factor, a considerably more important one, which is the Neolithic itself. This is a factor that has been present at various times. Now, however, it is a factor of great importance, a cultural one, to which we must pay attention. The racial origins go back at least to the time of the Paleolithic, while the Neolithic factor is a much more recent one.

Homo sapiens? Apparently the question above is very difficult to answer. On this enigma, Dr. H. V. Harlan's extreme view of Dr. Leakey's Lower Palaeolithic finds, and our kind of evidence, has led him to doubt that there were any races among the present races seem-

Origins of race

in the same way as other animal species. When a population becomes somehow separated it interbreeds enough for each to change and until each has developed its own physical features. The result is a wide range from possible mixtures to extremes.

It is not known how many times this may appear or become established and is affected only by the shape of the head and familiar blood-group differences. It is not known whether it is caused from a single mutation or a series of mutations, since the changes

are not sudden, P.D. twin's

instead of drifting, is controlled by its usefulness in fitting the population better to its particular environment, and so two once similar populations might come to differ racially—that is, in some of their physical features—because of living in different habitats. (Genetic drift would always be taking place at the same time.) Mixture among races *after* they have taken distinct shape will of course produce still other racial types. But genetic drift and adaptation between them would have done all the work necessary to produce the most different races of *Homo sapiens* without calling in any outsiders like the Neanderthal men or the *Sinanthropi*, and so I prefer to leave these folk in the Lower Paleolithic graveyard for good.

At the same time it is difficult to demonstrate how adaptation may have operated on human races. In fact it has been possible to show evolution actually at work only on a few simpler forms of life, especially fruit flies. The best we can do is to look at the different types of living men and pass judgment on how they might be especially fitted, some for one climate, some for another.

It has been shown, for example, that weight varies significantly with the temperature, populations in the colder areas tending toward fat and toward stumpy limbs, and those in the hotter toward skinniness and lankiness. The former type, being more globular, has less skin surface to lose heat and more fat to protect it, and the latter has the greatest possible skin surface through which to shed heat, like an efficient radiator. (The basic principle is known to students of natural history as "Bergmann's rule.") This seems to have become a matter of racial inheritance in some groups. In the same sun-broiled desert belt live the Arabs of Arabia and the Tuareg of the Sahara, both of whom are of the White stock (and who protect themselves with clothing, even over the face in the latter case), as well as the Dinka and the Shilluk of the White Nile, who are of the Negroid stock (and wear no clothes at all). Now all of these are extreme in lankiness, with the Nilotics being the tallest men on earth. They are in great contrast to some extreme Northerners like the tubby Eskimos, who are particularly short in the limbs.

It is almost certain, as we shall presently see, that the flat, squat-eyed Eskimo face is also a special adaptation, serving to protect the eyes and nose from severe cold. It would seem similarly obvious that other racial features, like a protective dark skin in the tropics, or a light one in the cloudy North where healthful sunlight is at a premium, are also responses to the environment. But in fact there are various difficulties in the way of simple explanations of most such traits, and little is known anyhow of their actual biological meaning. For the time being, the argument that they are forthright adaptations is less a scientific proof than an appeal to logic, however strong. Eventually we will know for a fact how racial differences came about; now we do not.

Dark-skinned races of the tropics

Suppose we look instead at the races as we actually find them, and see how much of a pattern we can make out. First of all, in the tropical parts of the Old World—Africa below the Sahara, India, the western Pacific, and Australia—we perceive what seems to be the home of the dark-skinned peoples. Here are those whose skins are deeply pigmented and whose eyes also have a dense brown coloring of the iris. Of course we are at once taken back to the idea that these things are connected with the intense equatorial sun, to protect the tissues of the body and the interior of the eye from the harmful effects of too much light. But notice that this is not the outstandingly sunniest part of the world, all told. Some of it is desert (in Australia), but it does not include the great Arabian and Sahara deserts. Much of it is savannah and parkland. But a good deal of it, what looks like the central part, is rain forest, humid but shady. And this forest was, if anything, more extensive rather than less so during any period when the human races were becoming distinct. So this does not help out the argument for dark skin as simply a sort of super sun tan, becoming a racial feature in response to an overabundance of light. Drs. Coon, Garn and Birdsell have interesting

things to say about this dilemma,¹ suggesting that there may be other advantages for tropic-dwellers in dark skins (such as resistance to certain kinds of disease), too subtle for us to understand in the present state of our knowledge.

The Negroes of Africa seem to have their proper area in the Forest of the Congo basin and along the Guinea coast, all near the equator, even though Negroid peoples occupied almost all Africa south of the Sahara. Besides their dark coloration they have woolly hair and puffy lips. Both of these traits are distinctive, or specialized, making the Negroes seem what an advertising man would call "different"; they are certainly not primitive traits, and they suggest that this human line has pursued its own racial development for some little time. The woolly hair may be an adaptation protecting the head from excessive heat. What the thickened lips might be for, as an adaptation, goodness knows.

Goodness also knows the history of the Negro stock. Nobody else does. But men of the same type, much mixed with other dark skinned races, are found in the islands of Melanesia, from New Guinea eastward to Fiji. Between Africa and Melanesia—more than the width of Asia—they are not to be seen.

This is not true of the Negritos, a branch of the Negroes who share their essential racial nature except for size. They are pygmies, usually simple hunters, and their wide spread through this whole enormous tropical space is one of the most astonishing things which the study of race provides. Everybody knows about the Pygmies of the Congo, who wander in the forest and bring game to exchange for iron and vegetables with the Negroes of the villages. But fewer people are aware that these Negritos form the population of the Andaman Islands, at the opposite side of the Indian Ocean, off Burma, and that they occur also in the mountains of the Malay Peninsula and in many of the Philippines, and in New Guinea as well. Definite traces of them are found in other parts of Melanesia, Australia and the East Indies. Finally, and perhaps most important, there is evidence among the wildest people of India that her original population was made

¹Races: A Study of the Problems of Race Formation in Man.

up of the dark-skinned races, and that the Negritos were a major element of these.

What could have given rise to this strange state of affairs, which makes the Negritos seem almost more important in racial history than the Negroes? There have been various explanations, ranging generally from dubious to absurd. They are not, for example, leftovers from a time when all men were small, because all true men of the Pleistocene, at least, were of our size, and thus the oldest form of *Homo sapiens* must have shared this size. So the Negritos have somehow become diminished. Further, they must have had a common origin with the Negroes, since they have the same special, strongly evolved traits. At the same time they could hardly be Negroes who, in half a dozen different places, shrank in size, perhaps under the influence of environment. Even one such shrinking must be looked on as remarkable, and in fact it would be less of a stretch of the imagination to suppose the Negritos evolved small size, dark skin, woolly hair, thick lips and so on all together, distributed themselves around the tropics, and then in one place, or perhaps two, grew up again to be full-sized and what we call Negroes. I think it is the least stretch of all (and even this much hurts a little) to assume that somewhere, probably India, a basic Negro stock developed and gave rise to a stunted offshoot, with both branches migrating through the tropical regions, west to Africa and east to the Pacific, and with the Negritos being the more successful in anciently reaching and surviving in more places. This is a guess, but I am writing a chapter of guesses; just now I am suggesting a pattern, and not trying to write a story which cannot yet be written.

* In any event this does not finish up the dark-skinned races. There is one more, represented in the natives of Australia. But these people do not seem at all closely related to the Negroes or Negritos. With them they share the dark skin and eyes. They also share large teeth and somewhat protruding mouth regions. These things may be retentions of ancient, more primitive features on both sides, rather than evidence of brotherhood. For the Australians have certain other probably primitive traits, such as hairiness

of the face and body, hair which is wavy or curly or nearly straight beetling brows, and receding foreheads. All of these are definitely not traits of the Negroids but they *are* traits of the Whites. So there is at least as good—possibly better—reason for thinking that the Australians go with the Whites as for thinking they go with the Negroids.

In fact most anthropologists, following Hooton, have simply classed them as a primitive branch of the White stock. I prefer to regard them as a generally antique form of *Homo sapiens*, representing more closely than any living men what such a form might have been. Instead of saying the Australians are primitive Whites, I would rather say that the Whites are evolved Australians, which would even allow the Negroes to be evolved Australians also, but evolved in another direction.

On top of this, the Australians seem to have been a long time in their part of the world. You have seen the ancient pattern of their culture. Several fossilized skulls, especially the one known as the Keilor skull, bear witness to a considerable antiquity of the Australian racial type in Australia itself. Dating is a difficult business, but these finds after careful study strongly indicate an age of a good many thousand years, and argue that the primitiveness of Australian culture is no accident. There are also the well-known skulls from Wadjak in Java, Australian in type and probably "Upper Paleolithic" in date, meaning that they correspond in time to this period in Europe, and so suggest that the East Indies were formerly populated by this kind of man.

Today, of course, the type is found only in Australia, but its racial stamp is clear in the islands north and east of that continent—New Caledonia, New Guinea, New Britain—among the obviously mixed peoples of Melanesia. The type is barely suggested in other places, including India again, where it seems to show up dimly among the remnants of the most ancient parts of the population. In fact, judging by simple inspection of appearance, the study of nose shape and hair form, and certain indications from blood traits—and we really have little else to use—it looks

as though this original stratum in India might have been made up of two elements, the Australians and the Negritos.

So we have Australians in the East, having come long ago from Asia; we have Negritos throughout the tropics; and we have Negroes in Africa and in Melanesia, and a puzzling question as to where the Negroes formed in the first place. To make it worse, we have the Bushmen of South Africa, another people who, like the Australians, have an old hunting culture and an impressive claim to antiquity in their own home. In spite of their smallish size and their ultra-woolly hair, they differ considerably from the Negroes and Pygmies; and yet certain similarities in blood type do suggest some kind of relation or mixture, as I have said already. What does this mean as to Bushman origins? Let us be frank and modest and say we do not know.

Whites and Mongoloids and Indians

All these tropical and southern people are separated from the northerly parts of the Old World by barriers of a sort, such as the deserts of Africa and Arabia and the great Himalayan mountain range. But only the last is a really effective bar, since changes in climate once made the present desert lands more inviting. In any case there are gaps in the barrier, in China and in the Near East. Nevertheless it is to the north of it that we find the other great racial stocks, the Whites and the Mongoloids.

The White, of course, are at home in Europe, North Africa and the Middle East. In our own centuries they have been pushing themselves into other people's property everywhere, but this is an old habit. They evidently did it thousands of years ago in India, coming in from Iran and Afghanistan and overrunning the darker aborigines to form the variously colored but predominantly "White" India of today. And they did the same thing in Europe thousands of years before that, evicting the poor Neanderthals entirely.

The Whites are all light-skinned, obviously, but they have

developed an exaggerated phase of this in blondness, so that especially pale skin, blue eyes, and fair hair are common, often in combination, around a great center in northern and eastern Europe, and are sporadically found in other regions as well. Both the basic lightness and the extra blondness may have come about, as I have said, because of some advantage, or at least no disadvantage, of a thinner skin under the cloudy skies which hung over Europe and Asia during the long time while the last glacier



Main areas of the principal racial types of man (greatly simplified)

was in retreat, and after. Even if this is so, we have no definite idea as to how quickly such evolutionary changes—even such slight ones as this—might come about: whether blondness might have flowered rapidly, among the Mesolithic and Neolithic populations, or whether it was actually developing even among the first of the blade-making invaders of the Upper Paleolithic. In spite of all the splendid animals the Paleolithic artists painted, only one good portrayal of a man has come to light, a Magdalenian painted bas-relief, found in 1949 at Angles-sur-Anglin in France. This Magdalenian, clearly a White man, has dark eyes

and hair (and a huge nose). This tells us nothing, because most Frenchmen still have the same coloring.

Chinese also have dark eyes and hair together with various traits of the Mongoloid racial form. Such traits are straight hair, sparse beard and, above all, a flattish face with a small, non-prominent nose and a slant-eyed appearance because of a fold of skin over the inner corner of the eye opening. Not all Chinese have these features, just as not all Scandinavians are blond-haired and blue-eyed. Furthermore, the real center of this exaggerated Mongoloid kind of face seems to be eastern Siberia and the Eskimo Arctic. Drs. Coon, Garn and Birdsell have ably argued that this whole visage is a prize example of a racial feature coming into being as a result of evolutionary adaptation: if you sat down to remodel a human face to protect it against the cold, they say, you would finish with the face of an Eskimo.

The cold of Siberia today is fearful enough. Now, during the last glacial phase, this area was ringed around and cut through with sheets of ice, but was not completely covered, remaining a space in which Paleolithic hunters could live with proper clothing, and from which they could not escape. Here was a selection machine, and a struggle for existence, that would have made Darwin happy. For many thousand years the inhabitants were in danger of frozen faces and eyes, infected sinuses, and pneumonia. Supposedly they were not killed off entirely by the cold, and instead gradually evolved a face which is a protective mask. The brows became flatter, reducing the sinuses over the eyes, always a vulnerable point. The eye sockets added fat around the eyes, and an overhanging fold of skin gave extra protection, against snowblindness as well as frost. The cheekbones became broader and more forward-thrusting, or "high," further helping the eyes, and also protecting the sides of the nose, which itself became lower, and perhaps longer and narrower (as in Eskimos). This change, and still more fat on the cheeks, acted to preserve the air chamber of the nose and the sinuses inside the cheeks. Finally the broad flat face gave as little skin surface as possible for freezing or for penetration of the cold. In addition to all this,

whiskers became coarse and sparse; no beard at all, save one full of icicles from your breath.

We assume, then, that this special face, almost the type of the Mongoloids, came into being under great pressure, conferred an advantage in intense, dry cold. But it does not appear to confer disadvantages in other kinds of climate; certainly there would be no new kind of pressure to which the cold had done. Therefore this face was entirely self-propagating once the glaciers had gone; and these specialized Mongoloids spread southward even into the tropics, taking their type along, and bestowing it in some measure on such indigenous peoples as they met up with and married. Its home remains in China and Korea, but the Chinese exhibit less marked versions of it, and it is to be seen all down into southern Asia. It is not particularly characteristic of certain tropical peoples in the Philippines or Borneo. Except for the generally broad cranial bones, the various traits of the face (low noses, flatness and roundness, eye folds, reduced brow ridges) are much less common among the American Indians, but they are present enough to force in the Eskimos, who are set apart physically in other ways from the other Americans.

Now if, in the last twenty-five or fifty thousand years the Whites have been becoming in part blonder, and the Mongoloids more Mongoloid, then we might ask whether they were formerly more alike, or at least what they started from. For the Mongoloids the raw material was, I think, something like the American Indians. The latter have dark, more or less straight hair, dark brown eyes and typically large faces. However, they usually have large brows, and not seldom prominent noses. The signs of the fully developed Mongoloid face are rare. In the Americas they vary a good deal in type, and they are so far racially nondescript, though they certainly are more like the Asiatic Mongoloids than anything else. One may imagine such a former population in Asia—small hordes of late Paleolithic hunters recalling the Australians, Bushmen or Aungsas of Africa, which some fractions crossed the Bering Strait into America.

as became caught in the Siberian ice trap and went through a rapid evolution of the face.

There is further license for such imaginings in certain facts. It is true that there are still many peoples, especially in southern China and Tibet, who either strongly resemble American Indians or at least are not very "Mongoloid," and who can be looked upon as well other fractions of this ancient population which underwent neither migration nor selection. Another fact is the three skulls from the Upper Cave at Choukoutien, China—the same group as Locality 1, the cave of the Pekin Men, but in this case of Upper Paleolithic date. One skull looks rather Mongoloid, one is alleged to look Negroid and one, a large male, has big brows and a deep jaw, and would cause us no surprise if seen among the race of either Upper Paleolithic Europeans or certain tribes of American Indians. Now I cannot imagine, as can some of my colleagues, a sort of convention of the races having been held in this case or any Stone Age international marriages. I can see in these cases merely the sort of unspecific and varying form, with apparent interchanges of individuals to other racial types like Negroids, which have been clearly described in a collection of crania of American Indians from a single recent village. I think the Upper Cave people were Indians still resident in China.

Labeling the Mongoloids as coming from something like Siberia or Indians makes them in turn somewhat more like the Whites, but it does not make the Whites the same as Indians. There is still a difference, and we can go no further back. We know the Whites from the beginning of the Upper Paleolithic period they arrive in Europe, in a form not actually more primitive than today. They seem to have come from western Asia or the Near East. But if that is so, they were not confined to this part of Asia nor do they seem simply to have been one end of a great people, which merged gradually with "Indians" at the

Far East. There are clear signs of truly "White" peoples in the Far East. One of these signs is the Ainu, the ancient inhabitants of at least the northern half of Japan, who are brunet, but hairy and

unmistakably "White" in nature. Other signs are found among people who seem to be mixed in their racial origins and to include a White strain in their ancestry: possibly the Japanese and various groups in the East Indies, but above all the Polynesians of the whole eastern Pacific from Hawaii to New Zealand, who must originally have come from southern Asia. Thus the Whites would seem to have penetrated the Far East, north of India and the mountains, perhaps to the south of the area where the parental Indians and Mongoloids held sway, and perhaps before an expansion of the latter peoples almost completely submerged the Eastern Whites.

Beyond this we can hardly probe the racial past at all. Only long and thorough work in archaeology, coupled perhaps with lucky finds, will do more. A single skull found under the right conditions could tell us volumes. We see that a White race existed by the middle of the last glaciation somewhere in western Asia, and that very likely the early, Indian-like Mongoloids were present too, as well as the natives of Australia, who were probably in southern Asia and perhaps already in Australia as well. We may suppose that the special—what are usually called typical—Mongoloids, those with the flat faces, were forming in the time since then, sending their representatives into the New World only in the Eskimos, after the main groups of Indians, showing a far milder degree of these traits, had gone before. As to the Negroes and Negritos, we are simply at a loss.

And, of course, a principal reason why it is so hard to determine how and where races arose is the fact that the moving around of peoples has been a continuous process. It is not as if our major racial types had traveled once and for all into the places we later find them, and then had stayed put. Changing culture and changing climate have sent peoples repeatedly on the move, and we should only be fooling ourselves if we did not realize the great complexity of all these ebbs and flows, which in some cases must have led to the total replacement of one population by another. That is what seems to have happened to the late Neanderthals, as first one wave and then others of the Upper Paleolithic Euro-

years came drifting in. Surely climate must have somehow made it possible and desirable for hunting groups of a similar kind to move across what is now the Bering Strait into North America, a movement which began not long after the Cro Magnon invasion of Europe. And then later in Europe we have seen how the first influences of Neolithic culture filtered in from the Near East, followed by actual migrations of Danubian farmers with the farming culture full-fledged, who, compared to the Paleolithic and Mesolithic occupants, made a different and fuller use of the land.

Repeatedly, cultural advances must have opened fresh territories to man, or changed the same old countryside by making it usable in a new and different way, quite apart from such climatic changes as the retreat or advance of ice, and the spreading or shrinking of forest. You might realize that, for all the splendor of our own science, there are great parts of the world which are still barren to us. We have hardly surpassed the Eskimos in figuring out what the Arctic is good for; nations compete for pie-shaped pieces of Antarctica without knowing why they want it. Irrigation is still only promising us the key to the deserts; and we are still content to leave a large share of the tropical forests of South America to the Indians. The same is true of much near-arctic land; we push into it only for spot exploitation, as when we find coal on Spitzbergen or uranium around the Great Bear Lake, and we do not really call it home. We are just as unmoved by such territory as hunters may have been by some of the finest farming land; or both hunters and farmers by such things as the great natural seaports, or coal and iron centers like the Saar and the American Midwest.

So we may be very sure that there has been migration and countermigration from the Paleolithic to the present, increasing if nothing in more recent times. At any rate the "Neolithic" people of the modern world, meaning most of the supposedly primitive tribes known to history, are the net result of all the involved developments I have hinted at.

II

Asia and the western farmers

The Neolithic pioneers of Southwest Asia, those Near Easterners whose first villages are just now being dug up, probably had a newly made-over culture to go with their newly subjugated grains and stock animals. We know about their multi-walled houses, of course, but we cannot excavate their marriage customs. We can, however, put two and two together. Statuettes from various places (of somewhat later date) suggest that they dressed simply, in loose garments, probably a short wrap-around skirt or kilt for either sex, and a shawl, perhaps worn over one shoulder and under the other. And the painting of designs on the skin may have been popular.

Socially they seem to have placed an accent on the male and paternal side, and to have been willing to put their affairs into the hands of strong, not to say despotic, rulers. We do not know this, of course, but such ideas have been prevalent among many cultures of the West. Notice, for example, that even at this late date we ourselves seem to regard giving simple equality to women as a most noble, generous and highly civilized achievement, not the natural thing. In religion, if we can judge from the Norse, the Greeks and India, the ancient culture revered a group of powerful gods, derived from nature, and tending to be formed into a sort of family themselves. At any rate we may suppose that the kernel of such beliefs goes back to the early taking shape of this culture.

Having taken shape, it was ready to travel, and travel it did. We have seen that it went to Egypt and North Africa and, later, into Europe. At home it held on, changing with time, remaining

primitive in some places but advancing in others until it finally became the matrix of our own civilization. But that is getting ahead of the story. Let us see what happened to it in other parts of Asia.

India and the castes

It went down into India. Its tracks cannot be followed, for Indian prehistory is almost a void. When this prehistory begins to be deciphered it will be a great addition to our knowledge of the past. For in India there was surely a meeting of north and south, and of east and west, which produced a greatly varying culture and a caste-bound social system of such complexity that it now seems to be its own worst enemy.

What must have happened is that Whites from the Persian and Mesopotamian regions (modern Iran and Iraq) moved into western India with their crops and animals, meeting dark-skinned peoples of a Negrito and Australian-like variety who may still have been hunters like the Veddas of Ceylon. This might not have been the first time that White westerners came in, by any means. But whether it was a beginning or a continuation, there was evidently a fusion of racial types which ended by being predominantly White, and by giving rise to a sort of scale of color from a lighter west to a darker east and south.

As to farming itself, this took on, or substituted, new kinds of animals and food. Before 2500 B.C. there was an important civilization in the far west, in the Indus Valley. This, as we shall see later, was part of the civilization of southwestern Asia (the Middle East), but already it had elephants, humped cattle, bullocks and chickens, all of which must have come from the other direction, the east. India also came to use cotton in place of sheep's wool, and rice as well as the other grains. Were these things simply added by the immigrants of the Neolithic themselves, through their knowledge of domestication? Or did some of them arrive already domesticated from Southeast Asia?

India of today, with its philosophical and artistic developments, is too far along the road of complication for us to consider. But let us look at her castes, which are a unique social system. They do not seem to be extremely old, at least in their modern form. It has been guessed that they arose first through the mixture of races, or that they originated with ancient totemic groups in aboriginal times. They may actually go all the way back to the ancient Indus cities, but traditionally the caste idea stems from the Aryan invaders of about 1400 B.C., rather barbarous villagers who came in from Iran (same word as "Aryan") long after the Indus civilization. We know about these people because of the Vedic hymns, the great record which has made their language, early Sanskrit, so important among the earliest forms of the "Aryan" or Indo-European languages. (In fact discovery of this language connection was the reason the word "Aryan" eventually became so thoroughly misapplied to an imaginary race which supposedly civilized Europe at an unspecified time in a manner not known, but which is the classical example of a chimera with great political usefulness.)

The Aryans had four castes—priests, rulers, cultivators and servants—establishing the doctrine that people must be divided by occupation. And it is occupation which in recent centuries has given rise to the great number of modern castes, with elevator men and chauffeurs forming new ones; if there is not a caste of television repair men now there will be soon. But whatever may have started things off, this is how Kroeber explains what it has become:

The racial explanation is obviously inadequate. Castes do not represent race to a certain extent, but they also represent nationalities, tribes, common residence, religious distinctness, occupational status. Whatever sets off a group in any way may be sufficient to make it a caste in India. If groups diverge within an established caste, they become recognized as subcastes, perhaps finally to develop into wholly separate castes. Priests, public clerks, fishermen, street-sweepers are castes; so are the Pariahs.

in ill tribes that maintain their primitive customs—the Dravidian buffalo-milking Todas, for instance, are reckoned high socially. Clearly we have here a generic system, a pattern of organizing society, into which every sort of group as it actually comes fitted. Caste is a way of thought that the Hindu has tried to universalize.

That is the secret: "a pattern of organizing society." No other reason could have made it so important. It is strange to us and to our ideas to see how an Indian is locked into the caste he is born in, and how the castes keep aloof from one another. For their own purpose seems to be to preserve their distinctness. You must marry within your caste only, or face being outcasted, which is serious. And you must live up to the ritual requirements of ceremony and purity of your caste, which are more exacting the higher the caste. The topmost must not eat beef or pork, or drink wine, and may have to avoid or be careful about a variety of other foods or kinds of cooking. And they are strict about women and marriage, keeping the women secluded and not allowing widows to remarry, or sanctioning any divorce.

Further down, caste members may live lives less strict, may eat more kinds of food, do things no high-caste Hindu may, and be freer about permitting widows to marry again, and so on; penalties for doing the wrong thing will be less absolute and severe. But this laxity makes such a caste relatively "unclean," so that its members may pollute the food of the higher castes if they are used as servants, because of food they indulge in themselves. So the high-caste person must keep an eye on what's cooking and on what's cooking also. The lower caste may be so free and easy in its ways, or so automatically contaminated by its occupation, as to be untouchable to the higher levels, meaning that contact between them must be careful or the higher person will be defiled and have to go through a ritual cleaning up.

So there is a ranking of castes, starting with tradition, in which the superior ones pay for their status by observance of custom and current self-denial. For individuals, the castes have windows

England — *the* *country* — *but no do-*
with the country, you can only be poor.
themselves, and if they do not
decide to live in the country,
higher level of poverty,
can hardly ever be reached.

Now all this exists to have us to live in
strange society, where we have
little power. On the other hand, there
exists no perfect society, which
fully protects us. The other side of the
other side of the coin is that
what they do. For instance, in
those occupations which are not
of. Whether the case is a
laundry or laundry parlour, we
have the hered tax, and the
ilitary customers, etc. This last,
This last, indeed, serves as one
making the greater part of our
turn (apart from any other consideration)
use of land and so on. So we
never dream of it, and we do not
together neatly.

Now this is one way of organiza-
treme one in the country, in
which it makes us poor. But there
which it takes away from us the
change his position. But there is
society to protect us, and so on.

For instance, the *Country Life* is
an English magazine. *The Country Life*
A Reader in Country Life

different and expend their energies

in different ways. At the best, it does not add to your personal happiness; which is the chief end of life. You have no right to expect me to do it for you. I can be far more useful to you by working on my own account.

Let us not take up so much of your time to discuss a really pestiferous insect. Let me tell you on it at once. It is a new species, and I consider it to be a very bad one. It is of hawking size, and is very gaudy in color, being yellowish green with black stripes. It is really a pestiferous insect, and it is at the new

The desert and steppe

country. It has crawled into the desert and steppe, in which it infests oak, locust, and acacia; and it is also found in the central plateau, where it is rather rare. It is a most讨厌able insect, and a special experiment took place

to determine whether it had any enemies. But of these,

living near the grassy region, have their villages where they raise crops. They leave the villages during the winter wet season to drive their flocks of sheep and goats through the grass region on the desert's edge, while they themselves live in tents. But some of them, the Bedouins, live mainly in the desert itself. These are the Arabs you ordinarily think of.



The cultures of Asia

Camels make this possible. They were domesticated long after the original animals, and came into Arabian use in biblical times before the twelfth century B.C. Now the camel is the ship of the desert, you will have heard, and it became the key to transportation and trade. And by making over their own lives so as practically to become parasites of the camel, the Bedouin Arabs formed a culture able to exist in the poor grass region which is useless to other farmers, and even to pass through the sandy desert itself. Their products are camels and camel's milk; the latter they drink, and the former they trade to the people outside the desert, among whom they spend a month or so out of the year, getting in return other kinds of food, such as sheep, grain,

cows and coffee. But there are (or used to be) further items in the economic balance as well, to wit, collecting tribute from other tribes and villages, and raiding to steal camels and horses from other Bedouin camps.

There are smiths, slaves and occasional peddlers in the camps, but life revolves around the camel. Herding them is the pleasure and pride of the men, whose other great pleasure is fighting and raiding. They are not at all averse to being raided themselves, and like to keep some white camels, because these are easier to see at a distance than ordinary camel-colored camels and so are more likely to catch the eye of an enemy and tempt him to a raid. There is only one thing more valued than a camel and that is a horse. Horses are not at all suited for ordinary travel in the desert, which means that they need much care, and this in turn makes them all the more prized. And horses are vital for fighting and raiding.

So Bedouin life was geared to the Bedouin ideal of getting into a fight. For to expose himself to danger, to show courage, and to exult in victory to the point of drinking an enemy's blood were what a man should want. Society was strongly paternal, and the Sheik of a group or tribe, who should be an able war leader, had a strong, almost military authority.

Out in the grassy plains and steppes of Asia, an enormous area running from Europe and the southwestern Asiatic home of farming all the way to China, there appeared another pastoral culture, and one much more general. Its originators were doubtless early farmers moving out of the Near East, or people who soon learned farming at that source, who for one reason or another turned their backs on grain growing and gave their attention wholly to their live stock. Not that farming became extinct in the area, but rather that a new kind of nomadic culture gave the highest dividends, as shown by its great endurance and in fact by its historical importance.

Perhaps a degree of drying up of the climate was one cause. Perhaps the adding of the horse was another. For the horse was not among the animals of the original Neolithic group, and must

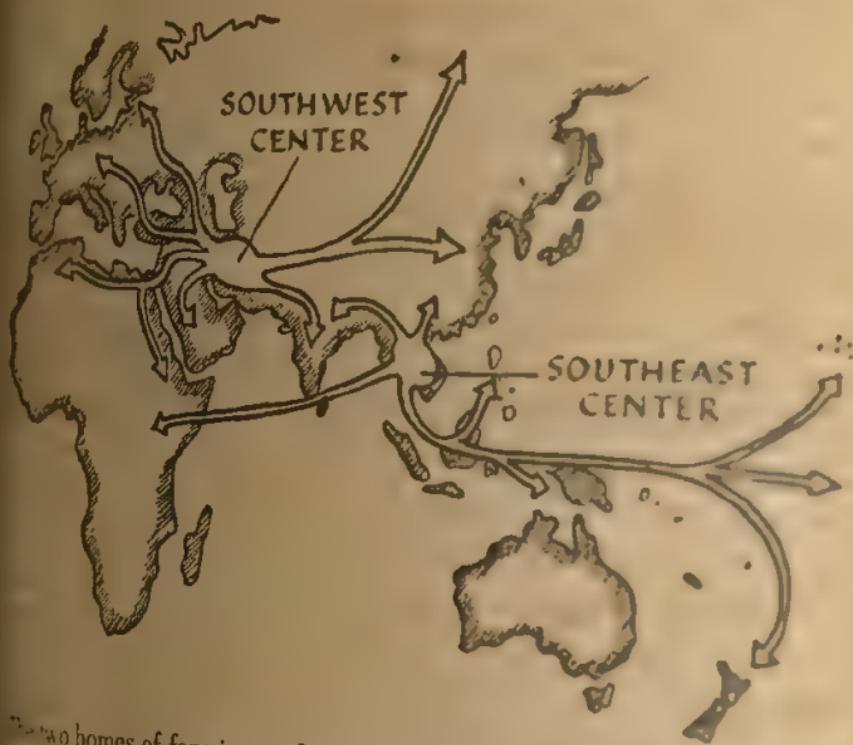
have been tamed in the middle of Asia by the farmers who came there. It was first used for carts, but before 1000 B.C. it came to be ridden; and this probably so solved the problems of herding other animals, and of moving about after pasturage, that the pastoral life then became a highly successful one.

It is, however, a difficult one as well, as it is lived by such people as the Mongols, the Kirghiz or the Kazaks. Horses and sheep are their particular sources of food, with the horse being the delicacy and the sheep the everyday meat. Both are milked as well as eaten, and mare's milk is made into kumiss by keeping it awhile in a skin bag which has already had kumiss in it: it is fermented this way into a kind of milk beer. The people live in permanent sheltered homes for the harsh winters, leaving them and hunting for pasturage in the spring; the new grass soon dries and so the hunt for good grass keeps them on the move.

Their summer house, for which they are famous, is the yurt. This is a round, tentlike object: a frame made of a collapsible lattice which is pulled out and set up ring-shape, some poles which are pulled together at the top, and a ring for the smoke hole to which the poles are tied, the whole thing then being covered by sheets of felt. As if this were not easy enough to knock down or set up, they formerly had smaller versions of the same thing which were simply kept on carts—the first trailers. As for felt (used also in boots and hats), this is made from wool which is spread out and tamped down on one big straw mat and covered with another. Then the whole thing is rolled up like a jelly roll and tied; two teams of feltmakers sit down in opposite lines, and roll the roll back and forth for an hour or so between them with their feet; and so the wool becomes all felted together into a large sheet.

The culture, counting its early forms, is essentially the story of inner Asia for perhaps the last six thousand years. It has been partaken in by various kinds of people. There can be little doubt that those who first had it, from Southwest Asia, were Whites and the Scythians of about 600 B.C. and before were actually remarked on by the Greeks for their blondness. The raiding bar-

banians on the border of the early Chinese Empire. Before 2000 B.C., were apparently not Mongoloids, for their descendants, the Huns, were Turkish in the type of their speech and their physique. However, the culture enlisted Mongoloids as time went on, so that in later history these have been its main practitioners.



The two homes of farming and Neolithic culture in the Old World and the hypothetical directions of spread

Like other higher nomadic cultures, it was warlike. This has probably nothing to do with open spaces where men are more likely to say, essential hardiness—but rather comes about because nomads, having small establishments, little to lose and the mobility which suggests attack, are the natural attackers, while sedentary peoples have larger establishments, accumulated goods and facilities mainly for defense. So the nomads not only filled the gap between the West and the Far East but also provided them both with a joint and familiar menace for thousands of years. The Hsiung-Nu and other barbarians were the scourge of the Chinese for twenty centuries, until at last the Han emperors struck back.

with such force into the nomad territory as to throw these people into confusion and turn their attention toward the Western world. The Huns were their vanguard in Europe, beginning the westward movement of Turkish and Mongol peoples, and foreshadowing the conquests and the gigantic empire of the Mongols under the khans. Their warriors, bowmen on horseback, using small sinew-strengthened bows, constituted a kind of attack the Europeans could not cope with; and the latter were lucky (partly in the opportune deaths of Attila and Genghis Khan) not to feel greater effects of the Hun and Mongol onslaughts than they did.

The Siberians: reindeer and shaman

North from the great home of the nomads, beyond Lake Baikal and the Amur River, lie the Siberian forests and finally the tundra of the arctic shore. Into this region neither the farming nor the livestock of western Asia could successfully be carried. Some of the peoples, in fact, have tried it: the Yakuts once lived farther south and have been pushed north by expansion of the Chinese and Russians. They still have cattle, at the price of keeping them indoors in winter and hand-feeding them. They have practically lost the use of horses entirely, though they kept horse skulls to use in ceremonies, a relic of the time when horses were important in their culture.

But this did not mean that the idea of domestication—of breeding animals for milk, meat or riding—could not penetrate, providing there was some animal to domesticate. And there is: the reindeer, who is at home and happy in this snowy zone, as he was in Magdalenian Europe. It seems clear, in other words, that this represents the last wisp of influence from the invention of animal breeding in Southwest Asia. In central Asia horses (and yaks) were added to the usual stock, but here the idea itself was applied in a new setting. Not only that, but we can almost see the process at work. The Tungus, a major southerly tribe, possess domesti-

cated reindeer herds, of a variety different from the wild ones, which give them milk and meat. And the reindeer are used as well for riding and for pulling sledges. People to the north, on the other hand (Koryaks, Chukchis), have herds which are not really domesticated but which are theirs nonetheless, and which they keep in touch with, so as to lasso an animal for dinner when it is needed. Still other people are without even this, and are hunters and fishers only.

The Siberian area is therefore one in which the people have taken up reindeer herding to a greater, lesser or no degree. It is one containing a conglomeration of peoples, though with certain general similarities in culture. (It surely contains, for one thing, the home of the specialized Mongoloid racial type.) Subtract the domesticated reindeer, and the basic culture is a high-level hunting one, having small settlements and living in tents, small wooden blockhouses or partly underground earth lodges. Clothing—and this is the area which is still horribly cold in winter—is of furs and reindeer skin, well sewn and well decorated with appliquéd designs. Furthermore, garments are fully fitted, with trousers and sleeves. This is where our own tailored clothes came from, imported to Europe by the central Asiatic invaders, some of whom at least must have been originally recruited from this older Siberian culture themselves.

The Paleo-Siberians, the non-reindeer-herding people, are interesting for their material objects and for certain likenesses which these, and their myths, hold with North America, suggesting some fairly recent contact of an unknown kind. But they are socially simple, and the most interesting person here, and in the whole Siberian region, is the shaman.

This is the man, or woman, who talks to spirits. He may call them forth, just as a medium does, in a séance. This is a performance held in a house or a yurt with the lights, to be sure, put out. The people gather, the shaman beats softly and rapidly on a tambourine drum, and begins to sing. After a while a new voice is heard in the house, and then others: the spirits have come and may be heard moving around; some of them may be animals who

can speak human language; some of them may speak unknown tongues; the drumming and singing go on, with a confusion of mingled voices and noises, some giving messages, while the audience sits in great excitement, occasionally giving encouragement by shouting at the right moments; finally the strange voices diminish and stop, lights are brought, and the shaman may be found sitting or lying in a trance.

Part of the performance has been the shaman's ability as a ventriloquist, producing a variety of voices and sounds as he moves about; part of it comes from the excited state which he has induced in himself, which he himself will think of as his shamanistic power, and by no means as simply a job of acting. Shamans, make no mistake, are great conjurers, and give demonstrations of ordinary parlor magic which are remarkable. But they do not at all look on themselves as clever operators, pulling the wool over the public eye, since they believe in their own shamanizing and in their ability to get in touch with spirits.

For here in Siberia they are professionals, with an actual calling which they cannot refuse. A spirit comes to a man (or woman) and bids him become a shaman, whether he will or no. It would seem as though this admired position would be sought, but few seek it. And it is apparent that those who do, or who are forced into it, are often those who are not well adjusted in our own sense being over-repressed or hysterical by nature. One tribe believes that a future shaman can be recognized as a child by his mictative nature and his tendency to fits. And shamanizing is sometimes taken up as deliberate therapy, because of a decision that the only cure for a patient's particular illness or depression is to become a shaman, and to go on being a shaman. That is how it seems to work for such people, because it gives them both a respected place in society and a vent for their unusual excitability.

Shamans thus are special people, with special personal powers not like ordinary men or women. And theirs is a life of peril as well: it is dangerous to have dealings with spirits and to go among them. More, a shaman acquires an animal familiar which gives him power and protection, but which may turn and rend him.

Worse, it might die and so cause the shaman's own death, because they have but one soul between them. In some Siberian tribes a shaman wears a distinctive costume, with designs alluding to his particular familiar and other spirit helpers, and perhaps with trailing strands of leather by which inconsequential sprites may attach themselves to his retinue.

At any rate the shaman sticks out like a sore thumb from the rest of the community. The same kind of personage is found widely in the rest of the world among similar simple societies: hunters, less developed "Neolithic" tribes, and those on the border between the two. Here in Siberia he is the one religious expression of importance. It is he who keeps this world, the everyday one, in tune with the world of spirits (there is no worship of major gods).

He has special jobs to do all the time. If somebody falls sick, it may be that his soul has gone a-wandering; the shaman, who alone can see it, sets after it and brings it back. When, on the contrary, someone dies, and the family yurt must be purified by sending the soul, which has lost its body, off to the place where souls go, then it is the shaman who is called.

Once again he gives a heroic performance, this time in full view. In a dramatic dance, he catches the soul with his drum and drumstick, tells it what it must do, leads it to the gate of the old spirits' home (in this performance, he is both there, before the spectators, and far away, on his errand), and persuades them to take the neophyte in. If things go wrong in the village, he holds a dance and thrashes things out man to man with the spirits. So, in this way and that way, he can deal with most of the upsetting circumstances which may befall a small community, through his ability to get into direct contact with special powers. The more so because he can give the whole group an emotional straightening out by one of his rousing dramatic performances. A very useful man.

The Neolithic cornerstone of China

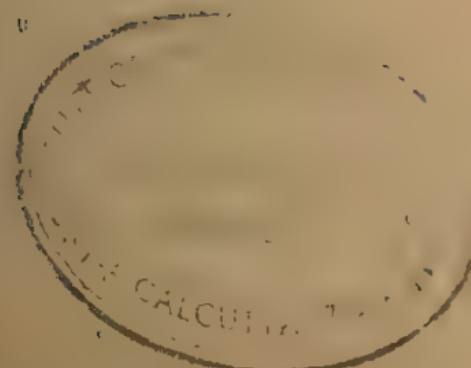
Starting with a continent, we have come down to a man in cluttered skin tunic beating a tambourine. Let us go back to the continent. We saw the outward flow of the grain farmers and their successful pioneering in all directions, including India. We saw a special offshoot of this existence, pastoralism, founded probably on horse-riding in inner Asia, and certainly on camel-riding in Arabia. We saw this idea, herding, intruding among the primitive forest hunters of Siberia, so that the reindeer became the major factor in the lives of some but not of others. There is one more thing to see as the result of the Neolithic discoveries in Southwest Asia: the founding of China. For agriculture here was of the same type, originally.

China today runs south to Indo-China and north through Manchuria, and one thinks of rice, tea and silk. But the original China was a small region, north and inland, in the great bend of the Yellow River. Here it is that the empire of history goes back into the past of legend and archaeology, and finally to a farming center of the Neolithic. What apparently happened was that the original Southwest Asiatic type of farming thrust all the way through the southern edge of the steppes, of Russian and Chinese Turkestan (Sinkiang), prior to the strong development of pastoral herding and probably at a time when the region was less deserty than it is now. This farming was probably spread, or transmitted, by people we might guess to be Whites, since the Mongoloid spread in the opposite direction in Asia seems to have been later.

At any rate, at the end of the line the culture reached—barely reached—the Tungus-like, Mongoloid ancestors of the Chinese who took it and carried forward their own version of it. Wheat (this is not rice country) must have come from the west, but probably the most important early grain, common millet, was native and may have been domesticated on the spot as a result of the arrival of wheat and barley. Cattle must also be from the west.

In striking contrast to the Near East and to the nomads of Central Asia, the Chinese have never consented to use milk. On the contrary, they have always been fond of pigs which, though first from the beginning of the Neolithic in the west, have been notoriously "unclean" in the cultures which derive from the Near East, except in Europe.

The early Chinese made mud-walled houses (preceded by pit-houses), but of a style different from those of Southwest Asia. Their religion of gods, their emperors and their family life share a general character with the west, but they are nonetheless distinctly Chinese. Now China has not been as isolated as you might think, for there has been trade and contact across Asia at all times, but she has been far enough away so that the exchange was not mutual removes. Her culture has always had its native character, drawing from the regions to the south as well as from the west and from the nomads. What we see, in the beginning, is a more child of the Near Eastern Neolithic, but remote, and nonracially distinct from the rest, doing its own upbringing.



12 *The Pacific and the eastern farmers*

Down in Southeast Asia lie Indo-China, Burma and Siam, and beyond them the islands of the Indies, including the Philippines and Formosa. This is all an area of tropical forest and heavy rainfall. And it is not as close to the rest of Asia as the map makes it look. Its boundaries with China and India are rugged and so are the interiors of the islands, and therefore it is not easy to approach (remember the Burma Road to China). The ruggedness within much of it, its many mountain ridges and river valleys, tends to isolate its people, cutting them up into small communities.

It is the home of another culture development, distinct from the web of Neolithic cultures of the rest of Asia. By this other culture, however, I do not mean the civilization of the last two thousand years, the kingdoms which rose in response to massive waves of influence from China, India and Arabia. By the beginning of our Christian Era, Indian colonies, or states on the Hindu pattern, were growing up all the way from Burma to Borneo, and a thousand years later major empires appeared on Sumatra and Java, building many of the great temples and casting their shadows northward beyond the Philippines as far as Formosa. This set the Hindu tone of Indonesian life and art. Then Islam, on the crest of a wave of Arab trade and expansion, replaced Hinduism as a religion almost throughout the civilized area in the south (as did Buddhism in the north), and had the effect of breaking down the larger empires.

This final culture, the one we are familiar with, was a highly developed one, with large states, writing and impressive architecture. Never-

less, the chopped-up island and mountain geography has enabled forest and valley to shelter remnants of older cultures for what must have been thousands of years. We can, in fact, almost peel off the layers of higher culture, and so look backward in time.

Jungle hunters of Malaysia

If we carry this peeling-off far enough, we come down to nomadic and seminomadic hunters of the forest, especially the Negritos, whom we find in sole occupation of the Andaman Islands, and also in the interior of the Malay Peninsula and various islands of the Philippines. They use the bow and arrow, and live in rock shelters or impermanent villages of moderately well made but flimsy huts. The Andamanese are the most fortunate in having shellfish and turtle; their villages are the best built and longest occupied (a few months), and they even make a poor grade of pottery. Though these are the only surviving colonies of Negritos, signs of them turn up in ancient historic references in parts of the region where they are no longer found, and also in mixture with other people who may be presumed to have absorbed them. They leave their traces in small size, dark skin and woolly hair in Borneo, Sumatra and Celebes, and especially in the farthest islands of the Timor chain, such as Flores.

But the Negritos are not the only such hunting remnants. There is another distinct strain, seen in such peoples as the Sakai (Senoi) of the Malay Peninsula and the Kubu of Sumatra (and the Toala of Celebes?). Those are also nomad hunters, using a blow gun. They are hard to place racially. They are taller than the Negritos, but still short; they may have Negrito blood in them, but they seem instead to be most like the vanishing Veddas of Ceylon. This is to say that they are something like the Whites, but smaller and darker, and also something like the natives of Australia, but less primitive in head and face form. They are possibly another suggestion of a deeply submerged White strain, ancient in eastern Asia.

The hidden Neolithic of Southeast Asia

The living people I have described are only two examples of hunter-gatherers, and archaeology has unearthed various pre-Neolithic or early Neolithic cultures throughout the area, to say nothing of remains of the earlier Paleolithic. Too little is known at all this at the moment to make much sense out of it. If, however, we stop the peeling-off process before going down so far we find a simple Neolithic culture, among the uncivilized peoples of the backwoods, below the historical level but above the hunters.

Such people live in many parts, from the mountains of Formosa and the interior of Borneo to the islands strung in a line south of Sumatra and back up to the mountains of Burma and Indo-China. But for all this scatter, there are strong resemblances among them which argue a unified culture based on gardening, native to the area. The people themselves are Mongoloid in nature, though shading off into unmongolized, American-Indian-like types with vague evidences of a White strain as well. No Negroid or Negro-like ingredient can be seen, but otherwise this unholy jumble of inscrutable ancestors tells us nothing about the age of the culture or the time of arrival of the now dominant Mongoloid element which we may assume to be the latest, and to have come from the north.

The "culture" of these largely pagan peoples covers a great many different tribes, and is not exactly the culture of any one of them, so please insert the word "typically" before any statement in the description which follows. Their villages are isolated and sufficient to themselves in their affairs; they may recognize the general tribal affiliation, but the tribe does not function as a unit. They ask only to be left alone, and offer danger to the stranger. They are glad to welcome him, on one condition: that he leave no body behind. For this is the home of head-hunting, a persistent and important custom from one end of the area to the other, something of a deterrent to neighborliness. Against this, villages

in many parts are palisaded for defense, or otherwise protected by having a ditch, being built on a hill, and so on.

Houses themselves are well constructed, of heavy timbers, and are usually on piles, raised off the ground, and reached by something like a notched log for a ladder, leading to the door, a landing, or perhaps an entrance through the floor of the house itself. Defense may be the basic reason for the raising up of the houses, though in this damp climate, where the pigs may trample the ground around the house into a mire, it is doubtless a comfort to be above the ground even in the most peaceful times. In some places each family may have a good-sized house. In Borneo, on the contrary, families have their own apartments, of a few rooms or alcoves, in a single long house for the entire village running along a riverbank for several hundred yards, with a porch or gallery its whole length. This kind of house is a major piece of engineering and construction, being set with its floor twenty feet up, and holding five or six hundred people.

But all this solidity of the house does not mean that its owners never move. For the method of clearing and planting is that of slash-and-burn, cutting and burning the trees and brush, and



Southeast Asia and the Pacific Ocean

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planting and cultivating with a digging stick. In Borneo the nearby land along the river is all used up in the course of about twenty years, whereat the people may literally chop the house down, cutting the piles off at the ground, dismantling the timber and floating the whole apparatus, or as much of it as they can use, downstream to a new spot. But in other parts the people manage to avoid moving by taking in so large a territory roundabout that the trees will have grown up again on the oldest used land and it will be fit for cultivation once again.

As to the crops, everybody knows the place of rice in East Asia. But that kind of wet rice, grown in paddies and in terraces on hillsides, and plowed with the buffalo, is the "civilized" staple, and not part of the culture we are looking at. Some of the pagans have it (as in the Philippines), but it is obviously a later introduction to them, just as are American corn and various other vegetables. An older crop is dry rice, grown more like other grains and usable on hillsides without terraces; this is important for example in Upper Burma and in Borneo. And millet, ancient in China, gives signs of being also ancient here, more so than either kind of rice.

But the vegetables which seem to be most at home—not necessarily the most important except rarely, but grown very widely—are yams and taros. Yams come in many varieties and are, practically, unsweet sweet potatoes; and taro is something like a big turnip. These are plants which are suited to a humid forest. They are of course quite different in their doughy nature from the grains of Southwest Asia. This is a disadvantage because after they are harvested they will not keep as seeds will.

As for domestic animals, these people are poorly off compared with the west. The only ones they have long had (always excepting dogs) are the chicken, who is a native himself, and the pig, who seems to be native just about everywhere, since he was a member of the cast in the Neolithic of Southwest Asia as well. With this small barnyard retinue, you might think that the people eat eggs until they begin to cackle, but here is a surprising diversity. They eat chickens and eggs very little (the hens are not prolific layers anyhow), just as the Chinese do not drink milk.

Instead, chickens are kept largely for sacrificing and for fortunetelling, augury-fashion, from their bones. So there is a considerable amount of hunting and fishing as a source of meat for the organs, with spears and blowguns, and with a variety of nets and a multitude of mechanical traps of the most ingenious and effective kind.

In arts and crafts there is other evidence of borrowing of things probably not present when the "Neolithic" culture was first founded. The people are good workers in iron and brass, making swords and ornaments, but the use of metal seems to belong to an upper level of the culture, meaning that they originally relied on stone tools. Weaving and dyeing, mostly of their own cotton, is also widespread and excellent, and dress nowadays is often a long skirt or a full toga for women, and a breechclout and an open-fronted waistcoat for men. However, the more out-of-the-way peoples give evidence that dress was formerly slighter, fashioned mainly of bark cloth, which was made from the inner bark of certain trees, especially the paper mulberry, beaten into pliability and endurance. Now of course there is no way of knowing that bark cloth in turn does not go back to a Mesolithic stage of culture, but that is neither here nor there; it certainly was an element in the culture we are talking about.

In any event one thing about which the Southeast Asiatics and the Indonesians have long been enthusiastic is decorating the body, clad or not, in more permanent fashion. Burmese Karen women stretch their necks with high collars of brass rings. Dyak women of Borneo wear similar-looking things around the torso as a sort of combination corset, etc. And infants in several parts have tourniquets put around the head while it is still soft, to give it a more unusual shape or to flatten the forehead still further and so exaggerate that round, round Mongoloid face.

But these are local specialties. More generally beloved is tattooing of the skin, and above all accessory adornments to one's smile. One such is filing of the front teeth to points or other designs, with sometimes the knocking out of a selected few, or the nailing onto the gums of a decorative metal plate. Another is the

darkening of the teeth themselves in some permanent way, often by chewing betel nut, which not only has a minor narcotic effect like smoking but also turns the teeth to the shade of mahogany. One final, well-nigh universal effort for loveliness is the stretching of ear lobes by means of big buttons or plugs set into pierced holes.

Class, clan and social teamwork

Socially these people live in isolation, having at best some non-aggressive contact with others, especially their own tribe, keeping to themselves and marrying within the village. They have few internal problems. There are chiefs of a sort, without much authority; the chief is more like a magistrate than like the stronger rulers of many cultures in the west of the Old World; and affairs are largely in the hands of a council. If you look at the social structure of communities, you find social classes and rules of descent but, as you see them here, those two things are less familiar to us than the names might imply.

They have, in many parts, upper classes, commoners and slaves. But wealth, not power, is the difference between upper and lower classes. The "best people," an informal aristocracy, give feasts, and have more social cachet, but able commoners carry their weight readily enough in council or public affairs. If there is a difference in appearance, it is in the greater elegance of dress, bearing, tattooing and so on of the upper class, while a commoner is freer to be uncouth.

The upper crust would not think of addressing others as "churl" or "varlet"; they are the social leaders but not through arrogance and their daily pursuits in general are not different from those of the lower class. As for slaves, these may be war captives or descendants of captives, but they are not like Uncle Tom; they are unpaid servants but they are not bought and sold (except in a few spots, under Arab influence) and they are pretty much mere members of the family. After all, they do not differ in origin or background from their masters, in this relatively simple culture.

There may even be intermarriage between classes, though this is taking chances with one's own status, and is usually frowned upon. On the whole there is a certain democracy in society, both as to polities and in the sense in which we normally misuse "democratic," to mean "not uppity," "willing to rub shoulders with all sorts."

Another way of dividing society, found in parts of Indonesia, is by clans, a matter of descent. We ourselves go by families, and we follow the male side. To do so may have been characteristic of the general Southwest Asiatic culture, and you have seen the elaboration of our idea of a family in the "veins" and "bones" of the Rif. But clans are a different tack. They do not emphasize your particular personal blood relationships. Instead, the community is broken down into a number of well-defined units, and you are born into one of them because it is the clan of your father, if the clans of the tribe are patrilineal (or your mother, if they are matrilineal). You know well enough who your blood kin are, just as we do, but it is emphatically those kin who are members of your clan who are your important relatives in life.

The whole clan is considered to be descended from one ancestor, however remote, and to be tightly related anyhow, so that any member of it is a closer relative than half of your actual blood relations. The clan contains, of course, your brothers and sisters, and also your first cousins through your father's brother (talking about the patrilineal variety). But this clan does not contain your first cousins through your father's sister, for she has married a man of another clan, and her children take their clan from that man. These children are your cross-cousins, as are those of the brother of your mother, since these (your mother and her brother) also must belong to a clan other than that of you and your father.

Clans are exogamous, which means that you do not marry within your own. Its women are practically sisters to you, and such marriage would be incest. Thus clans are different from the castes of India, which are endogamous; there you avoid actual incest but you marry inside the caste.

Clans are also different from the complicated kinship systems

of the native Australians. But here a certain likeness appears, for clans can and do fit into this kind of system. The Australians distinguish between cross-cousins and parallel cousins (which are children of a pair of brothers, or of a pair of sisters); so do clans. The Australians recognize big classes of those who cannot marry and those who may or should marry; so do clans. Kinship in Australia controls a lot of behavior among the individuals; so do clans. And in fact clans are imbedded in the Australian machinery itself. In a manner of speaking, if you should try to do what the Australians seem to be aiming at, but do it by simplifying and lumping, and omitting the formidable terminology for your kin, so that you give everyone a convenient segment of society to serve as his relatives, you would have clans. This is a manner of speaking, to be sure, not a theory.

The clan, then, is a man's background and his strength. Clans also have their mutual relationships and duties. Here in certain areas of Indonesia, for example, one clan may normally get its wives from a particular one of the other clans, and may exchange certain kinds of traditional presents with it. At the same time it sends its own girls as wives to a different clan still, and has different obligations in this direction. These gift exchanges are very important, and are not a simple item of the social amenities, as they would be among us.

Sometimes the clans are grouped into two major, opposite units of the community; or else the major, balanced division may exist without clans (or be practically the same as a single pair of clans). These divisions are called moieties (halves), and marriage takes place only between them. They emphasize the importance of exchange between social units, not only of mates but of various things of symbolic value. Knives, for maleness, for example, are given in the same direction as husbands; cloth, for femaleness, in the same direction as wives.

For they express a general idea of how life, spiritual as well as social, is divided, and how it is related to the universe in general. One moiety may be identified with certain principles: earth the outside of things, youth, the coast; while the other has the

posites: heaven, the inside of things, age, and the mountains. They thus ceremonially trade and make presents, and in so doing they make the world go round, so to speak, because they recognize accepted social and spiritual values, and see that they are properly distributed.

This idea of dualism even has a more definite counterpart in a few places, in a pair of gods, a male of the sky and the mountains, and a female of the earth and the sea. But such gods are not notable in the religious ideas of the region, which run instead in two other directions: to hordes of minor spirits and godlings (associated with all kinds of natural things, or with special assignments like frightening your enemy) and to a very widespread ancestor worship.

Lacking well-defined high gods, they lack well-defined public cults. The religious approach is highly itemized, and their prayer book, if they had one, would have more the spiritual quality of a Sears Roebuck catalogue. By this I mean that observances are practical and suited to the occasion. The Filipinos have legions of little gods who seem like technicians, waiting to be invoked to do the one thing each knows how to do. And everywhere a great proportion of spirits are simply pests, to be avoided, driven away or destroyed. This kind of work, as well as healing and fortunetelling, is carried on by shamans, whose ministry is basically like that of the Siberian variety, including trances and séances, and who are responsible for a certain amount of ghost control. Along with all the above there is a mass of omen-taking and spell-making, which anyone can do and which everyone does.

If there is one rather special rite, it is head-hunting. Although old heads are kept, and people are glad to have them as trophies, that is not why they are hunted. In fact they are not usually taken by individual men but rather by an organized raid on an enemy village, in which only the needed heads will be cut off, from fallen defenders when possible, with other victims being captured alive as slaves.

There is glory for the taker of heads, but the impulse is not blood lust; rather it is almost sacramental. It may stem to a large

degree from the idea of capturing and controlling the dead man, almost as if you were making him your own in that way, instead of an ancestor for the village he belongs to. In some places this is definitely the reason, and they may even head as much, while they speak to it in friendly and open fashion and feed it some native beer—but let us stop there. In case neither the head nor its owner is in a good position back.

But along with this, the immediate reason for taking a head apt to be a direct ritual purpose: in Formosa for ancestors, in Borneo to end mourning for a chief, in Nias to invest a new office, and in Indo-China, as in many parts of the world, as a necessary prelude to the marriage of a young man. Head-taking is like the official seal on a document, without which the document is no good.

A problem of beginnings

Here, then, is a broad kind of culture in the southeast of the Old World which is still a good deal of a mystery. It has considerable unity, and tribes may be found on the northern and southernmost fringes with cultures much alike. It is clearly independent in type from the cultures of western Asia. Does this mean that it was based on an independent discovery of the use of domesticated plants and animals? It certainly looks so. The taro, which are apparently the oldest in use (like taros and yams, as well as the plantain-banana group) are the ones most unlike the original plants in the west, and show some signs of having been long domesticated.

Further, Professor Carl Sauer, the geographer, believes here was the first, the original, discovery of plant domestication by man. According to his belief, Mesolithic fishing peoples along the rivers and shores of Southeast Asia were often sedentary (like some American Indians you will see later) and allow them to experiment with domestication, under the

the plants which they used for fish poison, for dyes, bark cloth, and not only for food. This kind of plant is the simple setting out of roots and shoots; that is, a method of duplicating existing plants, rather than the whole cycle of plants which can be propagated only by seed. The sowing of grain, Sauer thinks, was actually invented when knowledge of planting had traveled to western pen valleys and hillsides where seed planting was planting from cuttings more difficult.

In conclusion we have, at least, an acceptable theory for the invention of the roots and fruits of Southeast Asia. The question will come over whether Sauer is right in thinking that the people in the Middle East were domesticated only as a result of knowledge coming from Southeast Asia, and not independently. There is no direct evidence now. It is indeed likely that Southeast Asia was another place of invention. And in any case, was there another place of development of a complex of New World crops? But here again, who was responsible? Mongoloids? Negroids (often called "Indonesians")? Still older strains, like the dark-skinned peoples? And are there yet other layers to be discovered than those we have allowed for? These are all unanswered questions, and archaeology cannot yet tell us this history, as it has done so much to do in the West. But we can learn a little more by pushing our knowledge into the South Pacific, into other areas.

The Melanesians: the host who gives the most

Indonesia, and north and east of Australia, a continent which was probably never entered by any but hunters (the Australians and a Negrito population) until the time of the Melanesians, the Black Islands. It would need a long history of exploration if it had not been the great theater of our campaigns in the South Pacific: our early forward bases in Fiji, the New Hebrides, New Caledonia; our slow moves from Guadalcanal through the Solomons to the Marquesas, then westward through the Solomons through New Georgia to Bougainville.

at the other; our pounding of the great Japanese bases in the Bismarck Archipelago and our seizing of the Admiralty Islands and part of New Britain itself; and finally our progress down the north coast of New Guinea until we jumped at last at Halmahera, across the line into Indonesia.

Except for this, Melanesia would be generally unfamiliar and also generally unhealthy, with a good stock of insects and tropical diseases, headed by malaria. But it is possibly the most fascinating part of the world for the study of man. Consisting as it does of islands, some close to Indonesia and some far out in the ocean, it tends to keep cultures from mixing freely, the exact opposite of the plains of Asia. And the islands have a great variety of size and form. Some are large—and New Guinea is enormous—but the inlanders, especially those in the chilly highlands of New Guinea, might as well be on a continent far from the water. For the coastal Melanesians are typically pretty good navigators, so that water, a barrier to long trips, is nevertheless a boulevard for short ones.

All this means that when men began to arrive, and group followed group, some kept themselves more as they were when they came, by settling in some out-of-the-way place, while others mixed, borrowed, exchanged and changed with those before them or after them, in every kind of combination. What can be seen to-day is the final result. The opportunities for untangling the web of history have been appreciated by everybody, but few people have proposed to untangle it the same way.

It is evident that the first modern men to come were hunters of the Australian and Negrito variety, probably in that order, for these strains must have passed through New Guinea to get to Australia. New Guinea may have been about as far as they could hunt elsewhere. The Melanesians of our own times are all stone lithic gardeners—really Neolithic—but signs of Australian passage are present in the faces of many of the people of New Guinea, New Britain and New Caledonia. As for the Negritos, actual villages of these live in the mountains of New Guinea, where they

cultivators rather than hunters; and diluted strains of them are more widely, in New Britain and possibly in the New Hebrides farther east.

The languages tell a story of a similar sort. In the interiors of the Melanesian islands, especially in the west—nearer Asia—there is a great variety of different tongues, not clearly related to each other, but having something in common as to type (which also recalls the languages of Australia). But on the coasts, and in the eastern islands, are found languages all of one group, the Melanesian, which is itself related to the great family of Indonesia. This group is obviously the newer arrival. Who brought it? Perhaps no very specific lot of people. But the later population does seem to be more what we recognize as Negro proper, like that of Africa, showing signs of having itself been affected by Mongoloid culture in its latest, minor waves.

So it is not easy to say anything simple about Melanesia, and I, in seeking to do so I shall be committing a fraud, emphasizing the likenesses rather than the great and significant diversities. But it is fair to say that the general culture stems from that of South-east Asia, and represents what must be an early form of it. For the leading crops are the roots and fruits, without rice; yams and taro, and also the banana-plantain family and the breadfruit tree, all of these things having been imported, along with pigs. (Pigs are never served for feasts; they are uneconomical because they must be fed on taro, and so they are usually allowed to run wild and are hunted.) Various other things are grown (or gathered); cassava, sweet potatoes, pumpkins and sago from the sago palm in different places. And the people are fine cooks. For reasons of soil, or of richness of the land? crop rotation? low population density? villages are not forced to move by soil exhaustion.

Houses on piles are not universal, though common. Clothes are typically, a grass skirt for women and a bark-cloth loin cloth. Men, wherever the men wear anything which can be called clothing at all. Tattooing is rare, being found only on the faces of known recent immigrants, since tattooing a dark skin is a waste of time. However, patterns of scars on the skin are

common, and may be the corresponding idea. At any rate some penchant for decoration by mutilation that occurs in Southeast Asia is evident, for everybody pierces his ear lobe and something in it, and many people pierce their noses as well for bone splint or a big shell ring.

Ties with Southeast Asia are plentiful in social life. Clans are pronounced importance, having great solidarity, and there is commonly present the division of a tribe or community into two exogamous moieties. The clans are usually matrilineal, and often totemic, meaning that they have a mystical association with a species of animal or fish or bird. Villages are apt to consist of a few related clans, and chiefs are of even less consequence than in Indonesia (except in Fiji, which is partly Polynesian). Also much in evidence are certain other elements of Indonesian life: formal gift-giving, and pride in the wealth which makes possible the giving of gifts and feasts. What comes out of the mixture of these elements may be something different from Indonesian culture, but the general ideas and values are there. Certainly a love of formality stamps all kinds of Melanesian social affairs.

The *kula* ring, of the islands off eastern New Guinea, is a famous illustration of this. Here prominent men are traders, who have partners, to the north and to the south, with whom they exchange visits. When a man goes to see his friend who lives in the direction which is clockwise around the ring, that man will ceremonially give him a bracelet made of a white shell. It is not just a shell bracelet but one which he has himself been given by a friend in the very same fashion; it has a name of its own, and has passed around the *kula* ring through the hands of other honored *kula* traders.

That is what makes it desirable to have, or rather to give. But the whole purpose of having is giving and spending, and a man who made any show of keeping and amassing such things in Melanesia would be just as silly as a New Yorker who came out of bankruptcy proceedings and showed as his assets the parties he had thrown on Long Island: bear that in mind. Then in due course, not too long after, the giver will make a return visit to the

to whom he gave the bracelet, and he may expect to be given a necklace of red shells, which is at least as "valuable" as the bracelet he gave, in the sense that it already has a name and a history of being passed around by traders of high standing. The men are going to their new homes, thus actually moving counter-clockwise, in a direction opposite to the necklaces, and so there is a sense of the reciprocity, the balanced but not identical exchange of marks relations of clans and moieties in Indonesia.

At the surface, the kula looks like trade, but it turns out to be quite different: a ceremony encrusted in careful etiquette. It is social rather than religious in its nature. It is very high in the social interests of the group which participates in the expedition, and of course vital to the social status of the man who is the leader of the whole thing, the kula trader. But it goes on no more and it turns back again to trade. The kula exchange is the reason for a trip, the reason everyone thinks about it, and a lot of important ordinary commerce in needed objects goes along with the ritual part, between the islands. And continual relations of a general kind are kept up, between the groups, between all between the partners, a sort of antidote to the isolation and isolation among communities of this part of the world. It is really a surprising and unusual institution in one mere way, that it is the joint property of several different cultures (in the West Island groups), and not of one only; it is like a miniature Pan American plan, or a well-oiled United Nations.

There is only one method of social advancement by the use of wealth and party giving, a motive about which the Melanesians are even franker than we are. In the Solomons a man can practically lift himself up by his own bootstraps, if he has the energy and the way is clear, and the work cut out for him is to try to become a *mwanekama* (which simply means person of influence, big shot). He begins to increase his food resources, enlarging his garden by getting relatives to give him a little spare-

¹ Kula is beautifully described and explained in one of the many accounts of a primitive people (the Trobriand Islanders) by Malinowski, in *Argonauts of the Western Pacific*.

time help, and begging a few extra young pigs, which increases work load because food for the pigsty must be grown. Having plans laid out, he announces he is going to build a larger house. This is taken as a sign of what he has in mind, and now other men are willing to pitch in and give substantial aid, under his organization, with skilled builders acting as foremen, others doing heavy work, and everyone in general partaking in such work as tracting as making thatch for the roof.

They know that when the house is done there will be a great feast there is, the thing which quickens every Melanesian soul and all his food is eaten. Morning comes, as to a little boy on the fifth of July whose firecrackers are all gone but who knows no tent. The food is no more, but he has his house and his wife and good. Now he can more easily persuade people to help, and get him advantageous deals in food and shell money. He will probably add a wife or two, young widows perhaps, who have to work hard but who are already trained, and are glad to get a husband especially a mwanekama, which gives them position in society. The rising mwanekama himself goes on, giving next a great festival, on a bigger scale than ever, with feasts and presents to the whole community. It is a career none but an energetic man can undertake, and he has to slacken off eventually, but he has made his mark and will always be remembered for his public services.

In fact a mwanekama is Guadalcanal's only person of consequence. The same kind of a person on Bougainville is called *mumi*, but this man takes his duties as presiding social figure more earnestly. He actually erects a clubhouse and gives it which attract to his court followers, who owe him a sort of allegiance and act as a clique. And he will hold parties in the style of a rival *mumi*, showering presents on him with the idea that the rival must reply in kind or lose his influence. This may go on until one man topping the other, until one is bankrupt and disgraced. Honesty is a snake in the grass; but the ordinary citizen's heart's desire, a feast.

The idea of a clubhouse is a common one throughout Melanesia.

Asia; and in the Banks Islands, eastward from the Banks, it is the thing which gives a man his standing. For here a clubhouse may have a large number of ranks in it—so that some of them may stand empty at times—and a man always his way from the bottom up, as far as he can, paying members of the grades above him with shell money which is a sum. So of course a rich father is a great help to a man. In Amakama represents a frontiersman, practically clearing land, this *sukwe* of the Banks represents entrenched. In the same island group there is another custom, a *kole*, the name of which means to sponsor something, you make that thing extra good socially (if it is a house) or important (if you have gone up a grade in the *sukwe*) by fitting it with a fine feast, which makes a permanent difference between that thing and other things of its class.

Well formality in trade and in social strife were not enough, it was in military strife as well. General hostility and weakness of tribes make a certain amount of raiding and fighting natural, but do there are Tweedledum and Tweedledee battles between tribes which fight each other as a matter of course, perhaps every five years, at the same battlefield. Even if the cause of this is something more immediate than renewing old rivalry, like charges of black magic, or stealing women (who have probably run off by invitation), the approach is usually something like a tournament of knights and tournaments, with perhaps a declaration of war by heralds, and agreement on the day and arrangement for the two sides to tidy up the battlefield jointly. One side may stop things, or at least end play for that day. In any case, children and certain others are not molested. Taking heads or eating the dead are not usual accessories to these tribal fights, and belong rather to more malicious raids on tribes. At the end everything is made up as carefully as it started, and the people seem to have got out of their systems fear, malice and fear of sorcery for the time being. Sorcery and the making of spells are prominent in the superstitions of Melanesians. Gardening magic, for instance, is

especially necessary, to make your yams grow, or perhaps somebody else's spells from making the yams in your plot and go to his plot. The rest of Melanesian religion can be summed up in "ghosts" and "mana."

As in neighboring Indonesia again, it is ghosts and small malevolent spirits which dominate the spectral scene, not gods, and ghosts are connected in many places with the secret society and are impersonated by dancers. Mana is another idea, a special quality, or strength, in something, which makes that something into a sort of charm. It can reside in a bone or a stone, which you can use to make your garden grow well, or your boat be worthy. A man can have it in himself, explaining why his skill and power is greater than another man's. Mana is all the same thing like electricity, making things work, or work better, according to their natures.

The Polynesians: birth, rank and the divine right of kings

If we now leave Melanesia and cross the date line, in the middle of the Pacific, we come to yet another ocean culture rooted in the Neolithic of Southeast Asia. We are in Polynesia, the widely separated island groups in the triangle Hawaii-Easter Island-New Zealand, and we see a people who are a surprise and a puzzle. Whereas the Melanesians are dark-skinned, the Polynesians are light brown, seemingly part White, part Mongolian. But above all, where Melanesia has variety, Polynesia has uniformity. The languages, of a type closely allied to Indonesian, also to the main Melanesian group, can almost be called dialects in their differences from one another, and the language shows nearly as great a uniformity. This is partly because the great sailing skill of the Polynesians made the open ocean between distant islands, and so allowed repeated contact; but it is mostly because they arrived from their earlier home in the not too distant past.

This is a fine illustration of how a Neolithic people could support man. To a great extent the Polynesians came to depend on vegetable food on coconuts and breadfruit, the latter of which has doughy flesh and is something like a knobby avocado. Both of these foods grow on trees, this leaves the men free to devote themselves to fishing, in an enormous number of different ways to fill out that side of diet. They have plenty of other food, including birds, and most islands keep pigs and hens as well.

The life is not hard, and the people have time for arts and crafts. Houses are handsomely made, of timber, mats and thatch, and raised off the ground, except in some islands where they built on stone and earth platforms. Dress, in the old days, was made of finely made bark cloth which was a major craft, and tattooing and love of decoration by using flowers, feathers and the like were rife. The Maoris of New Zealand actually carved patterns into the skin of the face in bold curved lines, and put stones into the cuts. But this (*moko*) was the extreme of Polynesian refinement, and they did not mutilate their teeth like the Melanesians or stick bones in their noses like the Melanesians.

Social ceremonial reached a peak in Polynesia, in such things as feasts between important men. But the plan of society took a different direction from that in Melanesia. Clans were present, but the accent was on family lines in our sense. Genealogy and pedigree—being as nearly as possible the first-born of the parents of the first-born, etc.—determined rank, and rank was hereditary. For the class idea of Southeast Asia was improved on.

A village or district was ruled over by a sort of House composed of men with hereditary titles who formed a hierarchy, In the east, however, the nobles, with the king at the top, ruled over the commoners, with slaves at the bottom. Such a social arrangement made possible the expansion of authority, and this hap-

pened in Hawaii, in Tonga and in Fiji, where kings managed to conquer and rule large territories or a whole archipelago. Religion backed the whole thing up, for the ancestor worship of Southeast Asia also appeared in a new form: the gods carried the human lineage over into the divine, for the gods were the ancestors, and the king was their highest descendant on down, and so on down.

Added to this was mana, in the Polynesian sense, more than in Melanesia: a man had a given degree of mana just by practice and skill but largely by descent, so that the king was most, less only than the gods. So much had he that contact with a man of lower class might drain it off—pollute him—and kill a lesser man, whose constitution could not stand the extra mana. Thus the king and others of high rank were "tabu," in a word in a Polynesian word to boot. That is why the king was sometimes obliged to marry his sister, the only woman equally tabu. So the Polynesians seem to have taken material which was lying about loose in the cultures of their relatives in Indonesia and Melanesia—social class, ancestor worship, mana—and constructed a single coherent scheme with high gods, elaborate worship, philosophical ideas, and a strongly defined social structure.

This is shamefully short shrift for the glamorous Polynesians—but I cannot do justice all around. I want only to show how the Neolithic pattern of Southeast Asia was probably used by different kinds of people, in the tropical areas where its foods would let it travel. Polynesia adds its own special problems to the general ones. The Polynesians, judging from their careful genealogies and from language studies, could only have arrived sometime after the opening of the Christian Era, forming their special society and modeling their gods on their pioneering ancestors when they had reached their new homes.

There may have been an early and a late wave, with the Negroid element preponderating in the first and the Mongoloid in the second. But nobody knows where they came from, except that they came from eastern Asia; and guesses have placed the homeland all the way from India to China, not forgetting that a few things like

A selected king may even ally them with an element of nobility they came through Micronesia (the Marianas, Marshalls and Gilberts), serving an apprenticeship to living here. They have myths about the old home too, showing us definitely where it was. They seem to have had rice, and probably of pottery, on the journey. Does all this fit into the puzzle of culture in Southeast Asia? We still do not know whether the Negroids (part of the Melanesians) might have been the founders of this culture, or whether the Melanesians simply learned it from Indonesia by transmission.

The culture must have been moving out into the Pacific early. Fragments of pottery of a good grade have been found at Sipan in the Marianas, in a level dated by radiocarbon to about 1500 B.C., and the Marianas also had rice in later times. The modern Micronesians are something like the Polynesians in culture and type, and also a little like the Indonesians, though they have their own variations as well. It may be that because of war or population pressure one ancient group of Melanesians broke into the eastern ocean and became the founders of all Polynesia. As to the beginnings of this whole culture, Neolithic, however, we are left juggling Negroids, Whites, Negroids, and a culture pattern without a history.

13

African herders and gardeners

Africa used to be called the Dark Continent for reasons you can probably think of. It has now been pretty thoroughly explored, however, and it is clear that Africa's prehistoric remains are enormous, probably sufficient to make it seem like a side show when enough digging has finally been done.

Africa has given us not only the oldest known tools of man, also a sequence of stone industries as full as Europe's, and at least as many and as varied. The two continents were, furthermore, not having their own developments of the same Acheulean and Mousterian forms and methods of stonework. But in only two parts of Africa have we a good idea of who was concerned in all this, how it may have connected with the present. In North Africa there were Cro-Magnon-like people in the Upper Paleolithic, preceding, as in Europe, later White immigrants who brought the Neolithic culture. In the south, the once widespread Bushmen are still living their archaeological past as they were pushed and cramped into their desert refuge. We have looked over the Negroes and the Bushmen already. Between these populations are the Negroes, a puzzle as always.

The Sahara Desert—really continuous with the Arabian Desert on the other side of the Red Sea—is a good deal of a barrier to human beings, primitive or civilized, and usually has been insurmountable. For this reason North Africa is cut off and joined more to Europe, as the other shore of the Mediterranean. For the same reason the Neolithic newcomers bearing the new crops from southwestern Asia were forced along this Mediterranean coast, a channel. For a time life ran parallel above and below the

until Rome defeated and destroyed Carthage in 146 B.C. Since then North Africa has fallen back, with Islamism increasing its isolation from Christian Europe. The coming Arabs have had a great influence on the area, and this is the most important development of last centuries.

In contact with the Negroes south of the Sahara, the desert tribes have shown their vigilance only in the face of the camel. Camels, which came from Asia to Arabia earlier, arrived in North Africa about 400 A.D.; whereat some of the Berbers, like the



The cultures and areas of Africa

San before them, moved out into the desert to become the Tuareg, whose own name for themselves is "The Nomads". In this way trade and slaves, and later on Arab

But if the Sahara has cut the continent in half, that mean that no other impulses reached the southern part of Negro Africa there are two main kinds of culture, the "lithic" and seeming to owe their origins to the two Ages of food raising, that of the Near East and that of South respectively. These cultures exist, as you might guess, different environments, the forest and the grasslands.

Cattle keepers of the east and south

Ancient White peoples came into East Africa, probably from Arabia and over into Ethiopia, the Horn of Africa, with cattle and grain. Here in Ethiopia the blend of races is easy to see in the narrow noses and varying skin color. This White stock spread out and down into Africa, but far more faintly. The last wave of White came with it runs farther still, and may have carried cattle with them, so that there is a huge sweep of cattle keeping from the middle Nile to the Cape. The people will seem different to us, wardly, should you visit different parts, or see them in some good movies that have been made in East Africa: those tall beanpoles, the Nilotic Shilluk, Dinka and Nuer; the herds of Masai and Nandi; the dancing Watussi and the other dances of the lake country; and the great tribes of the south, the Basuto and the Bechuana. But there is a certain pattern, less, as there is in Indonesia or Melanesia. The natives live in villages, kraals of round, mud-walled, thatched houses, protected against lions by fences.

A man is expected to be a warrior, a spearman, and he must be a herder. For cattle are the center of attention. The people are not pronounced pastoralists, like the Asiatics. Some of them go out to pasture for part of the year, but they are not true pastoralists. Milk is important, but beef is eaten sparingly and meat is

Actually, agriculture is more important as the central crop is a millet (sorghum), a very old grain, though others have been added, such as maize and a number of common vegetables. Nevertheless, if you are going to live in East Africa you had better speak with a herdsman.

There are no mere livestock; rather they are both gods and men. In some tribes, greater love hath no man than his favorite bull. Sometimes this feeling mounts to something like religious狂熱, so obsessed are the people. M. Lévi-Strauss has written a wonderful book on the ritual language about things that pertain to the cattle, which is separated from ordinary things. More commonly there is the kind of special ritual law which you may find in the New Testament as well, about not eating meat at the same time as other foods. But in most of the area the cattle occupy a social place as wealth, on which one's social status depends. This may be a family affair as well as a community affair, as in cattle have come to reinforce marriage, in the ceremony known as the lobola.

The lobola is the bride price, paid by a man for a wife. I am sure you will blaze with indignation at so barbarous a usage as we are about to let us look a little closer at its meaning. True, the man gives the cow to his boy to his fiancée's family. True, the more cows the more pleased is that family. But the boy's parents do not want to look cheap, or to have an inexpensive daughter. The arrangement is, actually or in feeling, a matter of exchange between families on both sides, meaning that several relatives of the girl may help out in making up the lobola, and several relatives of the girl may share in the proceeds. For it is not a simple transaction, it is strongest, a long process and a major transaction. It is not simply a bargain struck in cattle over a young girl. The amounts of cattle begin with betrothal and continue until the girl approaches. The amount may be so great as to last for many years; payment may even go on after the birth of children. And on the side of the bride, it does not mean steak for everybody, because the cattle are

family wealth—social wealth, not unrelated to the social people get through the kula, or through buying degrees secret societies with shell money, in Melanesia. And this must be husbanded, and looked on as the source from which brides may be found for the young men of that family. Poor people may be forced, in different tribes, to use goats, lobola, or even iron, but these things are only imitations of the meaning of cattle.

If you grasp the social poundage which the cattle carry begin to see that this transaction is actually not a recompence, rather a bond between families, and a continuing one which is more than a bond between bride and groom themselves. Families are somewhat more closely knit than among ourselves, and so the lobola creates the bond between them it strengthens externally as well. And as for the marriage, the fact of the matter is that it consists principally of the cattle, and that is the African view of it. This puts it a little strongly, but the meeting of boy and girl are more the occasion for the lobola than the other way around; it is the marriage which makes the cattle move.

This is borne out by events. A Shilluk wife cannot fully divorce her husband unless the cattle are returned by her family. She would keep the children, who are the fruit of the marriage without the cattle. But a Shilluk also takes care to please his own family, because they can demand more cattle if some of the children die. The lobola is the marriage, and the children are the children of those who paid the lobola. If the husband dies, the widow remarries, future children are her dead husband's, and she may be expected to have children, married or not, probably her brother or her husband's, in order to "raise seed" to her husband in the grave. This is not really outlandish, because the custom survives, between the same families, with the same grandmothers, aunts and uncles, as if the husband were still alive. Actually the most usual thing is that she marries her husband's brother, and keeps something like her original position. Looking at it from the point of view of the lobola, it is the same marriage. If, on the other hand, it is the young wife who dies, especially with no children,

Then, her family is expected, or obliged, to send along her lobola, same marriage. Finally—and this is no rarity, and even in West Africa—an older woman, a widow, of great social position, may increase and insure her line by "marrying" a young girl herself: she pays the lobola, and pays men to become the fathers of the "wife's" children. In all of the lobola, all is proper and rational. You may note, in passing, that a child's true father and his social father may not be the same man at all.

Perhaps you will raise an eyebrow hereabouts, but I shall not expect you to adopt any of these ideas for yourself. I have not asked you to be a gibbon, nor have I asked you to approve of caste in any way. I suggest to you only that strong relationships between individuals and families, and stability of marriages and of family relations—especially for children, are ideals inherent in the social systems of the East and South Africans; and that the lobola makes the social and economic value of cattle to foster and strengthen the whole thing, and bring it into focus. This is even done without making marriage so formal a family matter as was in nineteenth-century Europe, for the Africans usually leave the choice of mates to the young, and have plenty of pretty customs of courtship, betrothal and wedding to emphasize this social side.

I only that, but there are in some parts schools for marriage, in form of the schooling for adulthood, or initiation rites, which are so common in the world. Such rites may be more or less severe and more or less direct, from tribe to tribe, but among the African cattle people the girls are subjected to them as well as the boys, whereas girls generally get off more lightly in other parts of the world. The Bavenda of South Africa separate the boys and girls when a group has come of age, put them through a course of lectures on etiquette and sex, while they are kept awake, made to stand in the cold river, do bizarre things like have their fingers squeezed or hold hot ashes, have things thrown at them (boys) or wiggle along on their stomachs (girls), on the evident principle that misery makes for memory. Then

THE NEW FARMERS—THE SECOND STEP

The boys are brought together for another course, lasting about a month and conducted by symbolic representations, on the subject of marriage and correct deportment, with more harsh initiations. The Zulus are more restrained and do not beat the boys, and as part of the training they put youth in charge of cattle for a while, to learn at first hand the right way of treating them.

But in general the boys, especially, have a bad time. First they are circumcised (and the girls may have some parallel attention), and they may have deep scars cut into the sides of some of their front teeth knocked out, along with the disagreeable formalities, which commonly consist of being sent out into the wild to care for themselves. The boisterous and dissolute Masai have at least relieved initiation with a few less calculated to appeal to the teen-ager. When a band has made up of boys just beginning to have whiskers, they are all sent to go from village to village demanding presents, which are given to the tribal elders in request for permission to hold the ox-slaying ceremony. A black ox is chosen, and from far and wide the boys come in. The game is to hang onto the ox by hump or tail, and to pull off anyone else hanging on, unless he is your mate, in which case you help him. Casualties are not few. There is no particular score; they simply stop, and if the ox has survived to this stage he is killed and eaten anyhow, and the boys are sent on finger rings made of his hide. After varying intervals each boy is circumcised without ceremony, something which hurts the mother almost as much as it does him, because if he cries she is beaten. Then they go through a novitiate, wandering about for a period, to gather once more to have their heads shaved by their mothers and be given weapons by their fathers.

Now they are men, and forthwith give us an example of another East and South African institution: age grades, or warrior classes. This group, like a draft call, becomes the youngest part of the standing army. The new Masai warriors dress and decorate themselves in striking fashion. While in this grade they cannot marry, they live in their own bachelor village, where their mothers

look for them and the uninitiated girls come and live with them. After their own initiation, which is late, the girls must act more strictly; it may seem rather tardy to come to that, but such is the rule. Like the Masai, tribes from one end of the region to the other have this system, the new group of initiated boys becoming the newest warriors responsible for the defense of the country, and each senior class moving up, changing status or retiring, and perhaps with officials or elders of the tribe being chosen out of a specific higher grade. It is the same system which Chaka, the infamous Zulu Napoleon of the early nineteenth century put to his own ends, by turning the age classes, a militia, directly into regiments for the army which he used in his conquests.

The local isolation found in Southeast Asia is notable here for its absence, and tribal agglomerations under a chief or a king are the rule. Clans and kinship systems are both characteristic, clans may enter into affairs, and it may be that the head of a certain clan is automatically the king. But the important units are families, under head men, which fall into a hierarchy, making up villages, then districts, then tribes under paramount chiefs. Individual families or leaders may transfer allegiance from one chief to another. This free ability to form and change large political groupings is so important as to figure in colonial politics: modern Basutoland results from the swelling of the original Basuto tribe by new adherents seeking a rallying point and a refuge from the Zulus under Chaka. Whether this head-man-large-family pattern has any relation to the same thing detectable in the old Near East Neolithic culture complex cannot easily be said.

As to the king, he may be important in religion, and perhaps in himself. Among the Shilluk he is the rain maker, the descendant and living embodiment (something like Egypt) of the deity Nyakang; and the king must not in any way be allowed to grow senile or lose his vigor, so that the divine spirit in him may not suffer. This is easily done: strangle him or wall him up in a hut before he is old, and then find his successor among other members of the royal line. In South Africa the king may similarly

be concerned with crops, but more as a kind of seer, determining the time to plant and being responsible for the goodness of the seed.

Across the grasslands of the Sudan, which run east and west in the other direction from the long East and South regions, there is strung a variety of cultures also based on herding and agriculture. Here the Berber and Arab influences, and Islam, are all strong, and the mixture of peoples is in classes and castes, in which there is a tendency for herds to be overlords. But there is a whole spectrum of tribes, these White, those strongly Negro, these mainly nomadic herdsmen, those mainly settled farmers. Some of the people form large nations, and some are ruled over by medieval sultans.

The Congo forest

South of this, in the forests of the Guinea Coast and into the basin of the Congo River, is a second major region of Negroes, which also harbors, in parts of the Congo, wandering bands of hunting Pygmies. The Negroes do no herding, because the forest keeps the cattle out, abetted by the tsetse fly, which carries disease. But they keep goats, pigs, chickens and sheep, and if they want more meat they have hunting to fall back on. Some tribes have special expert hunters; a few of them let the Pygmies do the hunting and pay them for the meat with the vegetables, which are Negro specialties.

The real source of Negro food, indeed, is the forest garden cleared by slash-and-burn and worked with a hoe. They have a long list of crops, delicacies and condiments and, like the Melanesians, they are good cooks. Much of their present stock is like manioc and corn from America (as well as tobacco), or from Asia. But old and important foods are yams, taros and plantains, apparently from Southeast Asia. To some extent they have plantations, for the kola nut (an important spice and narcotic).

and for palm wine and oil, and they may go on using such trees long after they have moved their village and fields to another place.

In its simplest form, their dress is some kind of bark cloth loincloth, for men and a "grass" skirt of palm leaves for women, which is like the skin clothing of the East Africans and makes you think of Melanesia. Also as in Melanesia, they cut scar patterns in the skin, especially on the face, and they go in for a certain amount of tooth-filing. They also are fond of cutting their hair in patterns, like little formal gardens for the scalp.

But the Negroes do good weaving in addition to this, and in fact they are admirable artisans and artists in many ways. They are indifferent potters but excellent wood carvers, so that their dashes, stools and free carving have not only appeared in art shows in the civilized West but have influenced Western painting itself, as witness the "Fauves." They do good work in leather, basketry (many wear basketry hats) and ivory. And this is the country of drum language, and of highly developed native music.

One of their most impressive arts is the working of iron (and other metals), for the Negroes of Africa are the best of uncivilized founders, from ore to finished blade. The East Africans also make iron, but among them there is a strange tendency to set smiths apart as people of low esteem, sometimes to the point of not allowing them to marry among the rest of the community, in contrast to the position of respect smiths hold in the Congo. In North Africa also smiths are a despised and servile group, apparently Negroid as well, an effect which may be connected with the importation of Negro slaves to do the smithing. The Congo peoples make hoes and weapons from their iron, including a fearsome throwing knife, a starfish-shaped affair, flat and keen, which is thrown whirling against an enemy. Now as to the use of iron, it may seem strange to have this Negro culture described as "Neolithic" when it appears to be in an "Iron Age," but you will remember that Neolithic refers to the kind of economy, the food-producing, and the iron is just a material replacing stone and not making any other difference in life. In fact iron points and knives

obtained in trade are used by the Pygmies, who at best are wise in a "Mesolithic" stage of existence.

The Congo forest tribes are not unlike the eastern hedges in their social ideas. Communities or villages are apt to be small, but "kings" and large groupings do exist. Relationships are similar, and a bride price is paid for wives. There is a fairly complicated legal and judicial system; but in both areas there is much reliance on magical ways of settling disputes or criminal cases. In the Congo the poison ordeal is used: a defendant is given poison, which itself will judge his guilt and allow him to be affected, or not affected, accordingly; or two people will settle a civil case by seeing who can resist an intoxicating poison longer. The poison will be fed to a chicken, while it—the *poison*, a unconscious agent, not the chicken—is respectfully asked a question and asked to kill the chicken in whose stomach it is residing. If the answer is yes, and to spare it if the answer is no.

The basic religious cult is ancestor worship, of a simple peasant kind. The young men are also initiated in harrowing rites, where in the eastern region the hazing is all clearly for instruction, in the Congo it is often connected with secret societies which are vigilante and rather terroristic, and which are not above killing and eating an occasional novice. These societies are a difference between grassland and forest areas, and a likeness between the Congo and Melanesia (and the same can be said of cannibalism), for they go in for the impersonation of ghosts and for the use of fright, to keep the whole community law-abiding but also to keep it in partial subjection to the society, for it is something outside the usual institutions, and a little like the old Ku Klux Klan.

One other feature of life in the Congo is more attractive than markets. Simple trade, of course, exists everywhere in the west, and the Negroes conduct it with the Pygmies, but among themselves they hold markets, perhaps every four days (the so-called Congo week), to which goods and food are brought for open sale. Payment may be in kind, i.e., by food or oil, but they have an actual currency, consisting of cowry shells, from the Indian Ocean, or of iron hoes. This, as you can see, is putting us

in hand of a new kind of organization, and one which is new to us. With markets, random exchange is replaced by a definite institution, which exists frankly for the bringing together of buyers and sellers just as does R. H. Macy's. It does not rely, as a market institution, on the social egotism which makes the kula a "good."

I want to press the distinction very far. In such a simple society the markets do not make the culture radically different from other such cultures, and may not be too distinct. A Pueblo Indian woman sitting beside U. S. Highway 55 with a dozen pots in front of her. And other kinds of Negro peoples make definite trading expeditions, or other plans for trade, and some, like the Riffians or the Bedouins, have long been in contact with more advanced ways of life. But nonetheless "market" is not a word which can be used for the usual primitive trading culture.

Some African question marks

Enough for this Congo area. What was its past? We are largely in the dark, as we always seem to be in dealing with the Negroes who attach the East African cattle-herding culture to the Near Eastern Neolithic base with no great quibbling, much as we appreciate knowledge of dates and places. But can we attach the Congo culture to that of Southeast Asia? Some of the customs, especially with Melanesia, are rather striking, but it must be remembered that certain of them would be coincidence either because of the forest itself, or the kind of life. While cassava, plantains and chickens must have come from the Orient, they were a success in Africa on their own merits, because they sort of tropical forest region into which these crops can grow!

But these very crops almost certainly are the ones which brought the Congo Basin to a gardening, Neolithic culture for the first time. But to whom? A Mesolithic culture with tiny micro-

lithic blades and a poor form of pottery is known to have been used for a long time in the Congo, after there were already Negro peoples in the Sudan to the north. This Mesolithic seems to have given way in the Congo only before iron-using peoples came. Was it a Pygmy culture? And did the Negroes appear later? Or were there Negroes in the Congo already?

Iron probably arrived from the East well after the birth of Christ, but yams and chickens might be much older. Could they actually go back to an ancient connection of the Negroes of Africa and of the Pacific, or at least the cultures of the Congo and Southeast Asia? Not only do both raise chickens; both sing death-tunes by sacrificing them. Both dress in bark cloth and palm-leaf skirts, and like to scar their skins or file their teeth. Both go in for ghostly secret societies and ancestor worship.

How much does this mean? Too many possibilities, to be known. It is all very well to jump to attractive conclusions if you are going to have the Negroes actually carry the culture of Africa, you must bring them by a practical route (not across deserts) and at a practical time—in other words, take account of a lot of disagreeable obstacles and unknown facts. And if most authors had done this, many best sellers would never have been written.

West Africa: a very simple civilization

Whatever the source of this Neolithic culture of the Congo, it did give rise in turn to a more advanced form in West Africa. Here the population flourished and became dense. Certain great nations grew up, extending into the southern Sudan, of which the best known and most important were Dahomey and Ashanti. Their contact with Arabs crossing the Sahara may have had an influence on this, but it is a Negro culture, and consists of a further development of the same institutions which are proper to the forest area in general.

It was not a matter of material inventions, although some of the arts like weaving and metal-casting, stood at a higher level than in Congo. Daily life was a good deal the same. Rather, political organization came into its own. The king of Dahomey was an absolute ruler of great power, surrounded by a full corps of ministers (ministers, marshals and magistrates) and governing also through local viceroys and chiefs.

Taxes were collected carefully and systematically from everybody, including the king, a nice gesture. This in turn was based on records of the people (kept by storehouses of pebbles) and on records of their possessions, gathered secretly by agents of the king who kept tabs on everything in the kingdom, even to movements of travelers, in a manner to do credit to the Russians. The king maintained a standing army, adding the famous regiments of Amazons two hundred years ago, and important sections of the kingdom were the result of conquest. (The Amazons were technically all wives of the king, and were commonly beheaded for "treachery," but few of them ever met him, being simply husky girls who would look well in the army.)

The native culture is flourishing today. While life is still of the village variety, there were already, in pre-European times, small towns which later became the modern cities of the region. Markets are highly developed, being held in various parts every day according to a schedule. (The most important ones fall on the first of the four days of the week, and religious ceremonies are not held that day; the gods themselves are shopping, and it would be impolite to call on them when they are not at home.) There are standards of value and of measure, and were originally insisted by officials to prevent cheating; they have practices of marketing and retailing, of price agreements and profit regulation, and co-operative marketing. This degree of organization is both highly encouraging to trade, which in turn was encouraging to artisanship and specialization, allowing men to devote themselves full time to the manufacture of particular goods without having to garden for themselves, while the gardeners could farm for the market as well as for the table.

The Dahomeans today also have co-operative work ~~and~~ for the young men—they are not a lazy people and good ~~and~~ an ideal—which exist to do certain kinds of community ~~and~~ opening new fields. They even have mutual insurance ~~and~~. All these things probably reflect the fact that the whole ~~and~~ society had become enlarged.

Another such thing, probably a better indication of the size, is the churches. Now the normal religion in Dahomey cestor worship, and the king's ancestors are the national well as the cause, in the past, of a good deal of human ~~and~~ But there has grown up a set of churches which are very like our idea of such a thing and are addressed to a set of gods, families of the earth, and the sky, and the thunder. ~~and~~ assemble, let us say, the pantheon of the Greeks. These exist simply for those people who want to believe and work in some of the higher religions, rather than as the normal way to make the crops grow or the enemies weak. They are not cults, and nobody has to belong. Yet a large proportion of the population nowadays does belong, going through a novitiate resenting death and resurrection which is much more extreme than the baptism or confirmation of Christians. These churches are in fact the parents of the mixed "voodoo" religion of ~~it~~ (*vodun* is the Dahomean name for a god), which does not consist of black magic and hexing as everybody seems to think.

So we behold in West Africa various improvements and developments of the forest Negro culture, topped by a few highly developed governments. These governments may have been barbaric and arbitrary in the extreme. For example, the king of Dahomey could collect taxes in the usual way. But he ~~had~~ had a corps of his private burglars, and he used to smooth his path by the graceful device of giving a great lawn party in which, naturally, nobody could be absent. Everyone was to be there, so no one was at home. And he could collect fines for the breaking of royal decrees, sometimes made for the purpose. He could let us say, the wearing of the same pattern of cloth by anyone himself, immediately dress up in one of the more popular ~~and~~

and send out the cops before the citizenry could get
a good change.

When I say "highly developed" government, I mean high for
the society in question, since it changed that society from a tribal
one, making possible the inclusion of other people's
territories and a sort of stability which might allow the culture and
economy to expand, always within their own limits. West
African governments and institutions, the high point of native
culture, are not to be sneezed at by uninformed snooty
Europeans, for they are far along on the scale of human
development.

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14 *The organization of society*

The Neolithic way of life was a success, to say the least, for most of us would literally not be here at all without it. All over the Old World, it pushed aside the ancient hunters. It increased the human population manyfold, as food became plentiful and dependable, and could be drawn from smaller amounts of land. As this happened, a problem moved out of the background into the foreground for the first time: how to get so much larger groups of people to live harmoniously and to care efficiently for their own welfare? In other words, how to form societies out of them?

The problem is present only in embryo among hunters or the lower primates. These nature-raiders ordinarily make up such small bands that they can be their own committees, so to speak, and meet their problems through the natural teamwork that comes from constant close association. But suppose the community becomes large enough that this will not serve? Then it has to have some kind of external structure. If you are satisfied with a very small house, you can stick boughs in the ground in a circle to shelter you, but if you want something larger than the individual boughs can command, you must take a number of pieces—bricks, stones or timbers—and fit them together in an organized way; then you have struc-

ture. Put it in other terms. Suppose you must have an army of 100 soldiers. You might round up 100,000 men, put them in a camp and give them the tools of the trade, but if you stopped there you would have a rabble, not an army, and one which would shortly begin to fight within itself over the food it did

not know how to distribute. Only when this body of men is tured is it any good. Everyone in it must have a status, and everyone else knows and can depend on. If you have on your shoulders you will be given the attention and of a large proportion of the 100,000, a certain body will in fact act by your dictates, so closely are they related in structure; however, you in turn will hurriedly raise to the vicinity of your forehead when a man with odd birds or stars upon his own shoulders draws near. The individual has his status, or place. He also has particular to play, like blowing a bugle while others sleep, which are connected with his status, and are also connected with what is expected of him which he personally must fulfill if the whole structure is to stand up and do what it exists for.

In addition to giving a status to every one of the 100,000 soundly conceived army would also group its members into and small units, some for fighting, some for supplying, some engineering and so forth, and it would have traditional relations and communications between the various groups. It could hardly expect to send an envelope with personal daily to each member. Instead the structure must take care of ordinary matters routinely, so that not only individual men also large segments of the whole can co-operate effectively.

So the army gives everyone his status and his immediate and makes them as plain as it is able. This is strictly a high degree. And it may seem strained to apply this to a living, because an army is an artificial affair, and not a sustaining society. Nevertheless, the example is a good one, especially as most societies have more structure to them than might think. This is still more true of the kinds of people have been reviewing, since they leave more of the regulation of their lives to their social organization than do we.

It begins even among the Primates. They have perfectly societies, you will recall. The members of a howling colony are all habituated to one another and, although they have no names to know it by, each has his or her status (as a to

male, or a young sprout) and his or her roles (as a leader through the trees, or a defender against attack by howling, or an adolescent jackanapes). In any case, we understand their relations as we might describe them in terms—each knows his place, and the usual reactions to each of the others—and they do not start to learn about each other afresh every day. This is the very simplest kind of organization, growing up through the constant interaction of the individual monkeys.

It is largely based on the fact that the individuals are not all alike, but differ biologically. They are born either male or female, with a difference most pronounced in adults. Like us also, they are very young, and gradually get older, changing as they grow. And even among monkeys of the same age and sex there are individual differences in dominance—strength and personality. These kinds of difference are quite enough to give the members of any group a set of individual roles to play and practice at. The same differences do the same thing in man, which would not be astonishing. The women are going to be the mothers, the babies are going to be young, and the men are going to be the most efficient hunters. The closest resemblance to the organization of primate societies occurs, as you might expect, among hunting-gathering peoples. But the great distinction, even here, is the element of culture. What might correspond, in human society, to the free expression of these natural factors in primate behavior is taken by culture and put into set patterns and institutions. And that is, of course, why human societies differ one from another, while those of howlers do not. For example, what women can do is the same anywhere, but what they should do is not. Their roles are always different from men's, so that the two normally work co-operatively. Among the !Kung, for example, the men hunt and the women gather vegetables, and the women look out for the younger children, as you might expect. Also, the greater actual strength of men does not mean they do a greater amount of work. They may be expected to take things that call for great effort, like hunting or fighting,

ing or breaking up new ground, but to leave the drudgery to women.

Women do the housework but are not always the ones when the higher arts come in, among "Neolithic" peoples. There are no special rules for all cultures, though of course in every culture no normal man would be seen dead doing women's work. Ordinarily it is the latter who are supposed to make pottery, weaving, but not always. The men make their own tools, claim social precedence, and usually conduct religious rites, commonly to the exclusion of the women, as among the Andaman natives. And the whole status of women can be high or low according to the culture, instead of being fixed by nature as wretched, as it is among baboons.

Age has its dispensations too, and especially among the primitive. Maturity arrives, bringing the full powers of manhood to the woman, but instead of letting this merely happen, it is signified in a majority of cultures by dramatic initiation rites, as we have seen. Nor does the time of these rites necessarily fall together with biological or sexual maturity, because the rites concern social maturity more than anything else. In later life heads become wise as blood grows cool and shape grows shapeless, and the whole group can benefit from these wise heads. So the direction of affairs in an Australian band is given to them by custom. And in the Andaman Islands age is the principal factor in social structure.

The Andamanese, who live fairly comfortable lives for primitives, often adopt other people's children, and thus are used to treating all children much the same (many a suburban mother would say that she is bringing up the whole neighborhood in the same way); and so strict family groups are a little vague. In general respect is paid to elder people, and they are addressed by name, honor and more or less treated as community parents. It is the old people, of both sexes, who form such government as there is, though it is not much, for they trust that nothing will go wrong (they will simply go and hide if a row breaks out). Andamanese do not use words for "father" and "mother," because they have

terms instead. And in place of typical kinship terms "brother" and "sister" the significant words are "older," "younger," "married," and so on. They simply have no nouns for their relatives, because they put such stress on age, and this kind of organization or behavior which goes with the idea of age is we see them.

This does not mean that the Andamanese are some lower form of man, but only that they have fastened to an unusual extent on age as the key to social structure and the way to distinguish individuals; and it does not mean that they do not know who they are related. Where we might say "she was my second cousin on my mother's side," and an Australian could put the same thing, sex included, in one word,¹ an Andamanese would stop and ask for silence while he concentrated and told you a long story of who had married whom and who their children had been, and so forth. He knows, but his language and his culture simply do not permit that all this is excess baggage, because they do things differently.

People with larger and more elaborate societies than the Andamanese and other hunters—i.e., "Neolithic" societies—are apt to make use of more kinds of status than those relating to sex and age, and more of the sort of thing we would call social position, rank and simple. Between a pair of baboons dominance would settle the matter of who was No. 1 and who was No. 2. And even among Andamanese and Australians the ablest man will, age being equal, have the most influence. But if there is a hereditary chieftaincy, or social classes, or castes, then natural dominance may be superseded by a cultural framework which holds people in particular positions. We compliment ourselves on our own democratic society, but you might as well know that it makes a great deal of difference, to you, where and to whom you are born. A child of Tom Smith will have to be a Smith himself and marry the child

¹In the Karawa tribe, for example, this would be *Djibari* or *Gogarlina*, depending on whether she was the child of one's maternal grandmother's son or of his daughter.

of another smith, whether he wants to or not, and we could furnish parallel cases. This sort of thing all implies that there may be other kinds of position which relate more to group you belong to (example: "Yankee"; properly, a New Englander; to a Southerner, anyone from north of the Mason-Dixon line, be it Minnesota or Brooklyn; to an Englishman, ~~sorcerer~~ from the U.S.A., which includes South Carolina).

At any rate a great function of etiquette is to take care of status: to preserve your own and recognize that of others, so that no injury shall result from some improper clash of positions. Etiquette is not basically a matter of whether you hold your fork like a screwdriver, though this will elevate your status not at all. It is rather taking action which belongs to the pattern, and so not only registers status but reinforces it by the very exercise. Let us start quite simply with the French *tu* for "thou," instead of *vous*, "you" (which is all we ever say in English). If you say *tu*, you are speaking to a relative or a friend, a social equal. For anyone else it is unthinkable, and people of low breeding may indeed use it as an insult. The same holds for German and other languages. And in Japan, or Samoa, or South Africa, much more involved differences in speech have to be used. A Samoan could say to a friend, "Have you bathed?" but this would be too personal for him to say to a chief; instead, it would be "Are you dry?" There may be as many as five different ways of saying one thing. (We are great Nice Nellies ourselves: all women are "ladies" and we have changed "graveyard" to "cemetery," "Memorial Park"; and "belly" is horrid so we took "stomach" which is not the same place at all, and now we cannot stomach "stomach" so we say "tummy.")

In the societies I have named above there is a good deal of the grading of individuals which calls for such etiquette. Among the Zulus and their neighbors, age, sex and position all count, with wives of an important man having their own relative rank as well, and with especially polite behavior being demanded of a wife toward her in-laws. A Venda, for example, may show four grades of respect by the pronoun he uses, going from second-

from singular to second plural to third singular to third plural, using the last for a chief. He or she must also employ gestures for greetings and conversations, perhaps kneeling, squatting, or sitting with legs tucked to one side, all depend on who is speaking, who is spoken to, and who spoke first. The really urbane person, politely listening to someone else, continually interrupt with exclamations—"Lion!" "Great!"—which are strict equivalents of "My goodness!" and "You *do* say!" And a Zulu wife is obliged to use *hloniphá* behavior and *hloniphá* talk to her husband's parents, which means dressing in a certain way and not eating or chewing in their presence, using their names or even words containing syllables of their names, and also putting her words in an unusual order, as though she were talking pig Latin.

All this sort of position is what Linton has called "ascribed" as distinct from "achieved," since it is what falls to people through the accident of birth and their normal progress through life. But "achievement," a beautiful word in our ears, has its counterpart as well in other cultures. Among the simplest, a man may stand out somewhat by virtue of particular force or hunting skill though a shaman or magician has practically the only kind of really special status. Up the scale there are more possibilities, so that people may become artisans or priests or people of property. In Polynesia a skilled canoe maker or architect generates his own mana by his accomplishment and so he actually becomes a priest of his trade. And in a really complex society there may be all the grades of standing which we recognize ourselves: in West Africa, apart from wealth and good birth, a person may be known as a "gentleman" and a "man of principle" by his demeanor.

Money is almost everything

But, in the middle cultures especially, social standing may be ascribed through what is aptly called a "prestige economy," meaning that one can amass a surplus of the world's goods (hun-

(they cannot) but can manage to spend it only for prestige, can take good, hard money and sink it in a Cadillac or a Maserati. The Cadillac runs beautifully and looking at the Matisse goes great personal pleasure, quite apart from the impact that possession of these things may have on other people. We can spend our cash on good food, travel and every kind of personal comfort, perhaps on a new heating system which is hidden behind the wall and will come out for prestige purposes only if we course about it to every unfortunate who comes to dinner.

But such opportunities, art possibly excepted, are denied to Neolithic village dwellers, who can turn their wealth, energy, and ability to personal enhancement alone. You have already seen plenty of examples. For East Africans it is the simple possession of cattle. In Arabia it is horses, and not, you notice, the camels, their basis of subsistence. In Melanesia, where they understand this very well, a mwanekama through party-giving can translate his bodily energy directly into prestige, while a clubman can go in for lending shell money at interest, and otherwise caring for his fortune, so as to buy his way upward in his lodge. And the kula is another fine example, because the worth of the kula necklaces and bracelets is purely their prestige value and nothing else. It was with the stone money of Yap, in the Caroline Islands, big millstone-like rings, which were difficult to make and transport, and which therefore had a sort of natural value and limitation, until a rascally Yankee brought in a load of actual secondary millstones, and very nearly wrecked the system.

On Ponape, another of the Carolines, there exists a well-rounded case of this kind. Its principal expression is a contest of the growing of yams for a feast held by a chief at the end of the season. Each man brings in his best yam to contribute, and a consistent winner will be given a title of honor by the chief, as well as the admiration of his fellows. A good deal of effort goes into this. The yams for entry are planted in the dark and raised in secret, so the family is willing to go hungry rather than eat into their chances of winning, though there is feasting enough at the end. But here is the oddity: once the yams are on display, Ponapean

Others insist on the most overdone modesty. Everyone is on the lookout for any sign of smugness or satisfaction, which will unmask the gossips and turn all pride to shame. The exhibitor of the largest yams is obliged to look about in wide-eyed innocence and protest that somebody else's yams are much bigger than his. This is such a general rule of behavior that a Ponapean should not admit he can do anything well. You may imagine the arrival of American administrators after the war, brought up in a culture which demands that you say you are twice as good as you really are, and double that again if you are in civil or military service. They go to recruit labor on Ponape; say, "Expert shovelers stand to the right." Any well-brought-up Ponapean, demon though he might be, with a shovel once in his hands, would be expected to blush and answer, "Why, if I tried to shovel I'd prob'ly shovel my toes off." Here, then, is a custom where status may come from work, and where the desire for it may control other values, often useful, so as to determine a whole code of behavior. It affects others' industry and husbandry (as in the Solomons, or Africa) and competition without aggressiveness, something we praise but rarely practice.

Kinship *the importance of being related*

I have been talking about the distinctions between individuals and group, those things which, according to the culture, give them their roles to play and the cues which they can confidently follow. What now about the way people are formally interrelated through kinship and by family groupings?

Kinship is not simply blood ties and marriage relationship. A baboon knows who her husband is, and who her own child is. Kinship is rather a cultural pattern, based on these things, but not the same from culture to culture and usually more elaborate than you might think if you were judging only by our own. I have seen the postgraduate systems of the Australians, and

the fact that, unlike ourselves, they usually make a distinction between a parallel cousin and a cross-cousin. You must stop and think before you can say which kind of own cousins are. But whatever the complications and whatever the variety, there are certain things all such systems do. They provide you with relatives, they tend to increase the number of relatives who are considered important, and they govern the behavior which you should hold toward them and they two of you.

In other words, kinship enlarges your resources in people. It may be the last thing you think you need, but you are excepted. Make yourself into a native Australian for a moment. I have already tried to make plain how these people stretch their resources and offset their poor culture by their enormous skill in tracking, hunting and finding food generally. They go further to offset their difficulties by maintaining relations and mutual obligations with other bands, through kinship and intermarriage. Thus a man need not be a stranger, even when he has come to a band where no one knows him, because by carrying through his kinship relationship from the last band, he knows how he stands with everyone. He can feel at home and be sure of committing no offense. He knows which men are his "brothers" and which women he may be familiar with and which not.

Kinship thus makes for stability among persons. Its meaning and that of the family, is reinforced by certain important rules, especially the incest tabu, and what is probably best called avoidance.

Incest is not only banned but considered horrible in all human societies, and the exceptions permitting brother-sister marriage (to kings in Hawaii, Peru, Egypt) do not count. Now we know we feel this antipathy instinctively. But we do not, for gibbon and other Primates do not avoid incest, alas, does occur in man in fact if it did not there would be no stated rules against it. It has some biological disadvantages because of the possible appearance of recessive heritable defects, but the popular idea of this is not very correct, and certainly the gibbons have not been

Actually we learn from our culture to reject the notion most sternly, and learn it pretty thoroughly; and the tabu have been a fundamental social invention of humanity. That word has not been said about incest, but the fact is that would be a great source of trouble anywhere. Not all societies have equally complicated kinships, but all are equally ignorant about the existence of kinship and the notion of families. Incest, particularly the abhorred mating of brother and sister, would set any system of relations at naught. In almost every society mother and mother-in-law are quite different people, and having them fuse into the same person would be incongruity and a clear loss to that family. Anyone's network of relatives would collapse like a pricked balloon, and the maintenance of the family's future would be threatened because boy and girl were not marrying new people, and this would be the community's loss as well.

What the Arapesh told Margaret Mead on this particular point is that these, the Arapesh, who live in northern New Guinea, are what unusual, or exceptionally "human," in their feelings about incest. They look on it not as an enormity but as an absurdity, being unaware of its existence and hardly comprehending Mead's investigation of it. "No, we do not marry our sisters. We marry other men's sisters." Says Dr. Mead:

"When I could get no better answer and no illustrations of incest I sent the young men to ask the old men what they would do if a man who wanted to marry his sister, and the replies were all identical: 'What? Do you not want brothers-in-law? If you marry another man's sister and another man marries your sister, there will be two brothers-in-law. If you marry your own sister, you will have none. With whom will you visit? With whom will you talk? With whom will you hunt? Are you mad, not to want brothers-in-law?' Thus incest is regarded among the Arapesh not with abhorrence and repulsion towards a temptation that they feel their bodies heir to, but as a stupid negation of the joys of increasing, through love and marriage, the number of people whom one can trust.

What incest would do to any higher system of society, like large families or clans, may be evident upon a little reflection. At any rate the force with which it is rejected is impressive, and the importance everywhere of relationship and family ties is

The same end seems to be expressed in another kind of avoidance, not universal but fairly widespread. This is special behavior toward certain relatives, usually consisting of some degree of avoidance, but sometimes of just the opposite: familiarity and joking, or even coarseness. By all odds the commonest manifestation is the rule of avoiding one's mother-in-law, to such a degree that some Melanesians may have to climb a tree at the sight of her; otherwise it may be a question of not passing her without looking at her, not speaking with her, or simply being very reserved and polite, like the Zulus. Other people may observe other kinds of peculiar behavior. All this may apply between father-in-law and daughter-in-law as well, and brothers and sisters are also apt to be the object of one another's avoidance, in various degrees again, as they become adults.

Now the reasons for this are not obvious, and I am not inclined to embrace the first Freudian explanation that comes along, even after noting the popularity of mother-in-law jokes among ourselves, which are notorious for their malice and lack of humor, and for their simple insistence that she is a disagreeable person, or ought to be. These avoidances seem to support the incest tabu along many lines, and they or their opposites—familiarity—also seem to mark down certain kinds of relatives as persons whose social dealings are best not allowed to be ordinary, because of any conflict or difficulty they might give rise to. The avoidance or familiarity provides these relatives with a special etiquette by which to recognize their special statuses and their relations with one another.

Marriage is for everybody

If there were in the world only one man and one woman, there would be no society to disturb, and so none of the above difficulties would arise.

worry about. The two could be mated—married in the gibbons are married—and so meet the needs of sex. They have children, and provide the children with parents and bring, although unless they had a definite culture to guide they would have some awesome problems to face. And they have a simple economic unit, man and wife, to do their tasks for their joint benefit. These are the things for which family—man, wife and children—exists. But such a family have described is really an abstraction, because it never exists apart from society. For human society always demands marriage—not the gibbon variety—and then uses it as the building block by which to make a structure of bigger units. This other aspect of the social structure or organization I mentioned earlier.

For one thing, isolated families of the above kind are quite practical, even among the crudest hunters, for both social and economic reasons. If either husband or wife becomes ill and cannot do his or her normal work, the mate and the children are in great straits unless they can turn to others for support. There are cultures where families may live by themselves for periods, and this is probably practical only when the food supply is such that anybody can make a living from it. This might be true of the Bushmen. But even among howling monkeys too small a group would be unable to defend its territory and so its food. And among native Australians, hunting calls for long training and practice for men to develop the skill they need, and a lone widow would simply not have that skill. So in hunting peoples, just as you find that the number of people in a band does not run very high, you find that it does not run down to a single family. This is added, of course, to the fact that a larger group is more secure anyhow, and that man is a social animal.

Marriage itself is affected by such considerations. We ourselves are monogamists, meaning that we have only one wife or, more correctly, must take our wives one at a time. Other peoples allow more than one wife, a few allow more than one husband, and a couple allow a sort of "group marriage," although

this is actually stretching a point, and does not mean what seems to say. Enormous amounts have been written about marriage and its evolution. Let us ignore it all, and only say about the evolution that it is a snare.

We doubtless have good reasons, quite apart from preference and religion, for insistence on monogamy in our own society, and the other people doubtless have good reasons for fostering other kinds of marriage. They are not necessarily "lower" forms in the evolution of marriage any more than other languages are "lower" because they cannot say "trinitrotoluol." Such institutions, as I said earlier, do not evolve in isolation from the rest of culture. Rather, they suit the cultures they belong to. Even if such a culture is more primitive than ours, nonetheless no evolution of marriage is involved. This sounds like a paradox, though it is not.

But the main point is this: monogamy, meet and right for us might be catastrophic if it were enforced on a band of Australians, depriving them of a way of taking care of any extra adult women there might be. These women cannot live with their parents indefinitely because hunters weaken and die early anyhow; and they can hardly live with other households in any capacity except that of a legitimate wife.

Similar and other reasons exist for the permission of polygamy (more properly polygyny) in higher societies. Its presence does not mean that every man has several wives. But women outnumber men everywhere, especially where the men engage in hazardous pursuits or go to war, and polygamy reduces the number of spinsters while at the same time it may ease the work in a household with two wives.

Kin, family and clan

Let us leave the forms of marriage and go back to the building up of societies by putting families together. Ideally they may just form a band, for mutual benefit. But then matters of kinship enter in, even among hunters, and this gives rise to more comp-

located units, and in fact to the sort of thing which seems to have become important and useful when groups became larger with Neolithic life. You find among the societies of this kind, as we have seen them in Asia, Oceania and Africa, a great variety of schemes of social organization, arising from just what rules they have chosen to follow in putting families together and deciding where they will live.

There is in this a rigidity which is basic to tribal life, and which we in our national life cannot easily see. We do, it is true, invariably give the wife and the children the husband's surname. But apart from that, the family may live with his folks, or her folks, or they can move to Cincinnati. The young provider may go into his own father's business and inherit it, or he may on the other hand marry the boss's daughter and become boss himself when the old boy can be persuaded to retire. All of this would seem shockingly untidy outside the West. Our simpler people abide by their particular rule of lineage and rule of residence. These rules do not invariably both favor the same side (male or female), which is one cause of variety in social organization.

The result is generally an approach either to a joint family or to a clan. The joint family is a superfamily, made up of the households of a man and his sons, or of a group of brothers (or, matrilineally, of sisters with their husbands and children), or some such array, perhaps extended over more generations or relatives. The Riffians gave us an example of such a kindred, in the "vein" which acts as a unit in many kinds of activity.

A clan is a more extreme and arbitrary alignment, for a joint family depends on tracing family lines for a given distance beyond which it may break up into several such families, while a clan is permanent. The clan will, if it is patrilineal, contain your father and his brothers, and your grandfather, and so on, but it will also contain members with whom you can no longer trace relationship by blood. It will contain your brother and sister, but your sister will have to marry out, and have children belonging to another clan, though she still belongs to your clan and takes part in its affairs.

If it is a matrilineal system, then your clan is your mother's people, and your father is the outsider. Family matters are for your mother and her sisters and brothers to decide. The important man in the clan is your mother's brother, who has responsibilities to you, from whom you will inherit; your father is just a nice fellow to go fishing with, whose own property will go to his sister's son, to his own clan, which is not yours. Thus our kind of father is divided into two men, which has some advantages. This particular case may seem clumsy, but only because we are used to our way of looking at things. Whatever its precise form, such a system is consistent.

You will see why exogamy applies—why you have to marry outside, even if some women of your clan are only distantly related to you by blood: the whole system would begin to crumble and the social organization with it, if members of the same clan married. Another common custom which acts as a prop for this kind of organization (joint family or clan) is the double-barreled one I described along with the lobola: the levirate, by which a widow is taken as wife by her husband's brother, and the sororate, by which a man's second wife is sister of the first (who may be living). This, as I said, keeps all the lines in proper order.

A clan, or a joint family, is of great importance to a member. Its other members are his real relatives, whatever feelings he may have for his blood kin in other clans. They are the people with whom he shares property, with whose affairs he is concerned, and with whom he holds religious ceremonies. They are the people he trusts and confides in, and the ones who will be his strength and his defense as he needs them.

This is how such a unit as a clan acts in organizing society, as an army puts men in manageable groups. It makes a number of households into a larger, well-knit group which can take care of many social and religious affairs. And it thus gives cohesion to whole clans, and allows relations between clans which in turn build them up into a functioning society of the whole. They intermarry, by the rules of exogamy. They commonly have mutual obligations, or certain reciprocal required behavior, perhaps as to

present and feasts as in Indonesia, perhaps as to the parts they take in general ceremonies, as in our own Pueblos. And they usually have responsibility for the acts of their members. The clan will rise to protect him, but if he has committed a crime it becomes the clan's responsibility as a whole, so that he must answer to the clan. And so the clan is a regulator of behavior and keeper of the peace.

If such a degree of social organization is to be seen among our Neolithic people, why have we not a higher one still? Why have we slipped back into a simple family system, with our most obvious concern being monogamy? The answer probably has to do with something which we have that the Neolithic peoples have not—politics. If, among hunters, basic family organization and kinship, plus general consent and the decisions of the older men, seem to be adequate for the harmonious action of a band, then among the villagers the more complex social organization and the expansion of kinds of status do a great deal of the work necessary for the operation of a larger society.

Clans or other extensions of the family are not the only subdivisions which can go into the structure. Social classes like those of Southeast Asia may interact with a similar effect, and so may the castes of India. But such cultures are not as a rule strong in political institutions. Councils are the most important arm. Law codes are found in few places, notably among such as the North Americans and the Indonesians; elsewhere justice may go by the methods of the ordeal and other kinds of fortunetelling. Rulers are only too apt to be despotic.

We, on the other hand, under the umbrella of our complicated constitutional government and our law for everyone, written for everyone to see, need not rely on the Neolithic kind of ward-and-district social organization to help us govern our lives and relationships. And our open economic system allows people to maintain themselves as bachelors and spinsters. So we have regressed大大ly from what must have been something more complicated, and perhaps we are still regressing.

Perhaps too far. Are we glad when, in our once patriarchal

system, we see Mrs. Smith divorce Mr. Smith and go back to her mother, Mrs. Jones, taking along her daughter by her first husband, little Alice Robinson? Our children of divorce have no tribal to tell them where they stand, and no clan which will always theirs; and their status as persons, despite the glories and comforts of civilization, is just a little unusual, uncomfortable and perturbed.

15 The meaning of religion

Is life complete with food and society? It is for the monkeys, but then the monkeys have no culture, and we have lots of it. Culture consists, as I have said more than a few times, of patterns, or abstract ideas which are translated into concrete objects or actions. Now that man has become able to handle such patterns he can no longer take them or leave them alone. Instead, he must accept them as his way of understanding his whole universe. And this in turn has brought him the most abstract, non-animal side of all his culture: his religion.

This is a sort of top level of culture, symbolic in nature, and above the technical and social levels. Man meets some of his problems with concrete tools, which are so easily perceived and comprehended that apes may imitate their use. (Be it remembered, of course, that the tools themselves are the products of abstract ideas.) He meets other problems—raising children, let us say—by various practical rules (though rules are more abstract than tools) which he follows to give his society more definite shape. Now man's handling of abstract ideas shows him still other things which no animal can recognize, and which correspond to nothing concrete.

For example, an animal may be aware of what it is like to be hungry or sick, while a man may be aware of what it is like to ~~see~~ being hungry or sick and to be apprehensive about it. But this is something he cannot lay his hands on or give orders about. He cannot pull it down from its abstract state. He must rise to its level with cultural weapons of a symbolic kind. In the awareness of such things as sickness and hunger mankind has

been introduced to problems which cannot be attacked by
spars nor yet with regulations, and which must be met with
third kind of resource, philosophy and religion.

There may be a dozen ways of looking at religion, or of understanding it, but for purposes of culture we might take this view. Man views the universe and, as animals cannot, he forms abstract ideas about it, such as "day" for the hours of light. He also has an idea of his own place in it: his needs and wishes. He will be only too aware that the universe is not a tidy system, harmonious and responsive to his wants, but that there are ugly gaps which must be filled somehow if he is to be safe. A hook and line will serve to close the gap between himself and finny fool, and so to satisfy hunger. But illness must be met with equal assurance, or it will have a strong demoralizing influence on everyone.

How to close the gap and somehow handle the illness? The illness is recognized not only as a bodily feeling but also as a "something," in an abstract way. So is the need to get rid of it. If the illness can be symbolized in a manner easily grasped by ordinary human imagination—as a spirit which has possessed us, or an evil charm—and if the emotional need to drive it away can also be symbolized—as a drink the spirit will not like, or as a countercharm to break the first charm and send it back on its maker—then the situation has been put into a form in which it can be handled. The action taken may not work. That does not matter, because the main result is the completing of the system of ideas or symbols connected with the situation—the closing of the gap—so that anxiety may be stayed.

I am not trying to reduce all religion to a treatment for heartburn, or even to give it an inclusive description. I am only trying to show its symbolic nature. I have used the fear of illness merely as an example. Religion is more than answers to problems. It is rather a way of putting the world into a shape which is comprehensible and satisfying. And I am suggesting that man's mental advance made religion, as a final area of appreciation of his world, not only possible but essential.

Myth, the storehouse of ideals

The limits of religion are not easy to fix on, and in fact I should prefer to speak of "religious behavior" rather than "religion." For one thing, the attitude of a culture toward a belief or an action might be the thing which made it religious. Compare Little Red Riding Hood and the Bible. The first of these is a folk tale dealing with the supernatural to the extent that it contains a talking wolf, we are amused to repeat it to children, but it is not religious simply because it happens to be supernatural. The second is our Scripture, the heart of our religion, and I need hardly dwell on the strength of the reverence it commands.

These would represent the two extremes of feeling cultures might hold about what may be generally called their folklore and mythology, which loom large in the lives of those who do not write their literature but who keep it alive by telling it. Some of their stories may be nothing but pleasant romancing. Many may seem like this but may also have an extra philosophical value or hold moral lessons. Such may be tales of origin, for example, or other explanations of important things, which may by suggestion teach people to honor their culture. Or they may be myths of violence and obscenity which, even while the listeners enjoy them, recognize and uphold, either directly or indirectly, the ethical idea that this is wrong behavior.

These myths may be recognizably religious in character. The Bakongo of central Africa, for example, tell all sorts of things about Nzambi Mpungu, supreme being who made the world and the laws and who is good, punishing all evil: the breaking of oaths, perjury, adultery, and disrespect for parents. Yet the Bakongo do not know what Nzambi looks like, and they do not worship him—their gods are the ancestors.

Finally there is the kind of myth which is deeply sacred, as it is in Polynesia or in Australia, existing along with the other kinds but forming the basis of ceremony, being kept alive by

Propriety and drama, regarded as we regard the Bible, and perhaps so sanctified as to be kept secret from the uninitiated.

So myth and folklore are means by which people express themselves a lot of their joint ideals. Among ourselves, two men may deal with strife, lust or terror. The author of one has values which he is clothing in action, and in his book he shows forth these values in strengthened form. The author of another innocent of such values, produces only a lascivious satiricalism. Doubtless, as a myth is retold, it is such moral values—those important to the culture—which make it survive, and the very retelling has in the past molded the myth in this direction. Thus a people's myths are the main repository of their philosophy. Probably many kinds of myth should qualify as religious, and not simply as philosophical, if we go by the definition of religion as using supernatural symbols or parables to fill gaps in man's understanding of the universe.

This view would certainly put within religion a lot of activity which we ourselves would not, offhand, recognize as religion. But we are used to thinking of religion as something well defined like the Christian belief in God and the Christian church, or like a rival religion such as Mohammedanism, which resembles Christianity in its highly developed and international character.

These are great world religions, helped in development by prophets, saints and scholars, and having scripture, dogma and strong ideas about heresy. They contrast with the disorderly and unexclusive nature of pagan religions, as those of the tribes outside the great religions, are called. When we are considering human history and the past of culture, these pagan cults are important, for the very reason that they are not international, and belong to local societies in a single region, answering the Mesolithic and Neolithic needs of these societies by a process of natural development. And so they show us what the needs are, and what the answers have been, in the form of certain beliefs and practices which occur again and again.

Magic, or how to do it

One of these is magic, perhaps the least "religious" of such things by any standards. You have heard of it before, and you are doubtless aware that this kind of magic does not mean sleight of hand, or something incredible in our sense. It means rather the working of spells.

Black magic is evil, done to injure someone else or at least to tip you at another's expense. Always with us, even today, is some sort of hexing or image magic, by which you make a dummy of your enemy, name it, curse it, and then injure or kill it by stabbing or burning it or poisoning it with a charm. In this satisfying way, a wish to injure or kill is symbolized and carried over to your actual victim through his image. And if anything happens to him—even though it is not exactly what you hoped—you can feel it was your doing.

Now if this business is so universal and so persistent, it is not hard to apply the same interpretation to the animal pictures in the Paleolithic caves, especially when some of the pictures actually show spears striking into the animals as well. So the animals (almost always game animals) were cunningly brought within the control of the hunters, whose intent might be to prekill them, so to speak, or to bring them to the neighborhood, to make them brittle and so on.

Magical villainy is everywhere. Australians secretly "point the bone," sending the magic like a death ray toward a distant victim. Berbers of North Africa will take a spell drawn up by an unprincipled student of the Koran and written in bat's blood, and drink it in the victim's drink or tie it in a tree where he must pass. Etcetera. But surely there is far more belief than actual practice, far more time spent in worrying what your enemy is doing to you than in scheming and executing some kind of a low blow yourself.

White magic has greater practical importance: the many spells which are used to help out in everyday work and to go beyond

the things a man can do with his hands and his tools. Hunting people use hunting magic, to make their arrows fly straight, make themselves silent and sharp-eyed, make the game stupid and slow. Gardening magic is a major possession of a Melanesian who cannot expect his yams to grow properly without good spells. And there is war magic, fishing magic, potmaking magic and so on. magic: the magical formulae of any tribe would literally take a book to catalogue, and if you put down even your own best magical tricks I think you would be surprised. Or did you never wish on a shooting star?

Probably everywhere the two outstanding kinds of magic are healing and fortunetelling, or divination. And well they might be, for illness and uncertainty are everywhere the most pressing causes of personal and social anxiety. That is why we ourselves are blessed with palmists, card readers, fortunetellers, astrologers and the like, and why we still see acceptance of every kind of old wives' cure or quack treatment, even in the face of the great knowledge and integrity of modern medicine. Can we really look condescendingly upon a Zande of the Congo, who will not go much as far as to the next village without asking his rubbing board (a small contrivance like our ouija board) whether he may? (Anything of slightly greater import, of course, would call for poisoning a chicken.) Or should we laugh at our own ancestors in Europe, who used the ordeal by combat as the Africans use the ordeal by poison? They solemnly believed that the justice of his cause alone would make a good little man triumph over a bad big man, who would otherwise chop him into catmeat. The mind boggles at the endlessness of divination and its procedures, and we had best go no further into it.

The same might as well be said about curing. We may note only that a particularly common practice is to let something out of the patient, or remove it by sucking. The doctor applies his mouth or a tube to the site of the illness, sucks, and then shows that he has removed the trouble by bringing a stone, bone, cinder, ball of fur or some such thing out of his mouth. If you know the feeling of relief and relaxation that comes over you when the

Dentist takes a last look at the cavern he has been drilling in patient's tooth, says, "There, that's all," and puts up his burr, then you can appreciate the positive good and comfort a primitive patient may get when the cause of his pain seems to be taken away, after which his system can go to work to effect a natural cure.

Of course, if the illness is fatal, it is fatal and that is that—but the chances are in favor of the cure anyhow. One other common feature of uncivilized curing is the taking of medicine, as we do. The medicine may be good because it seems related to the trouble (liverwort has liver-shaped leaves, so it must be good for the liver), or because it is rare and expensive, or for reasons nobody can remember. And it may be perfectly good in our own eyes, like many primitive treatments. For it would be strange if such things were not discovered by trial and error, just as "natives" discovered tobacco, beer and wine. But this would be an accident rather than medical science; it would strike its users simply as particularly good magic.

To them, magic is both scientific and religious. To us it is neither. Science, when you strip it to its essence, consists in recognizing the difference between (a) a reasonable guess and (b) a fact which can be proved. This is the very distinction which magic, along with most other primitive and civilized thinking, neglects. Magic attempts the same practical ends as science, but it does not care to dig out the explanations for what it is doing. It assumes that throughout the universe there are supernatural connections like telephone wires, running between actions and their results, and that these connections can be discovered and used; also that none of this is any more extraordinary than water turning to ice when the weather is cold. A lot of magical "logic" stems from what Sir James Frazer, in *The Golden Bough*, called the Law of Sympathy (like produces like), and I have just cited examples: another would be a row of young girls in New Guinea being obliged to sit stiffly quiet on a log in a hut, and so keep a sailing canoe of the village, away on a voyage, on a steady keel by a sort of distant body english. But such obvious "logic" is not neces-

MARY. Magic just works. I do not know, for example, any reason for knocking on wood, or why a rabbit's foot is lucky, or why a wishbone should grant wishes.

As to religion, if you feel that Christianity offers a philosophy based on compliance with God's will and His omnipotence, perhaps you can see that such a religion cannot contain any truth. When it degenerates into superstition and hocus-pocus by which people can be controlled by spells. So our churches condemn it vehemently, recognizing how enduring it is among the masses. But for people without such a philosophy it does not mean evil, and in fact it sustains them in the weakness of their culture, assuring them that they have ways of meeting problems that absolutely must be met.

- So true is this that a good deal of primitive magic is "public," meaning that it is not done for private ends, as we might usually think, but for the common welfare. This gives rise to the officiating medicine man, to whom the people will turn in need, to find the cause of a general sickness, or a drought, or to catch an evildoer by divining. So there is a group dependence on magic, almost like a cult in itself, though not quite. The Dinka of the Nile have semi-divine kings whose principal duty is making rain; even so they have lesser medicine men to help out at times. Such a man takes a perforated gourd full of water and makes a miniature shower. Then he goes into his house "to keep out of the rain."

Shamans and witches: powerful people

Magic is impersonal. Supposedly anyone can use it. The medicine man, or medicine man, is simply an expert in the business. So he is different from a shaman, who has acquired powers of his own and is a special person.

I described the type specimen of that species, in his Siberian habitat. This is by no means the shaman's only haunt. Previously the same man is found far away, among the Zulus. Here he lives in a different climate and a dark skin, but in detail after detail he

like his Siberian brother or sister: the shaman may be of either sex, he is a high-strung person, subject to visions and melancholia, going through a trying novitiate and getting a familiar spirit, as a method of cure for his neurosis, and ending as a professional who diagnoses and divines through his insight. It is plain that shamanism everywhere gives a neurotic personality a satisfactory means of adjustment, while at the same time it gives a simple society a useful person, in the form of a diviner and minor religious functionary.

So, ideally, there is a contrast: the shaman with his spirits, his second sight and his tensions; and the magician with his lore and training, otherwise as wholesome as a Boy Scout. But this is ideal. The Zulus recognize the difference, since they have both kinds. But other peoples may not. Shamans are apt to know a good deal of ordinary magic anyhow, and the culture may dictate that the magician should have some of the peculiar attributes and personal powers of the shaman. Thus it comes about that recognizable shamans, though less extreme than those of Siberia, South Africa and a few other spots, are found very widely in the primitive cultures of the world.

If shamans have special powers, they are not the only ones so blessed. Mana is another kind of power, which is apt to reside in a thing in Melanesia but in a man in Polynesia. But after shamans, the most striking manifestation of supernatural power is witches. Or rather the belief in witches, since witches, I hope you will agree, do not exist. The emergence of this notion, that living people supernaturally attack their innocent neighbors, have animal familiars, and fly through the night, perhaps in changed form, to a sabbath where together they eat the souls or bodies of victims—this emergence all over the world, and especially among Europeans, Africans, Melanesians and some American Indians, is truly astonishing.

Evidently it is a common human fantasy, a particularly natural projection onto the screen of the imagination of people's fear of the malice of others (educated perhaps by feelings of malice of their own). For that is the essence of witchcraft: the conviction

that witches have the power to harm you or your soul through the simple desire to do so. This is quite different from black magic. And all the stories about witches boiling a potful of eye of newt, toe of frog, wool of bat, tongue of dog, unbaptized infant, etc., goodness knows what other delicatessen, are secondary illustrations to the plain charge of witchcraft that got people hanged in England or Salem, or tried in Africa, as a close look shows.

Perhaps a witch has a special internal organ which causes her to be a witch. Or in some other way he may inherit witchcraft, without wanting to. A *ndoki* in the Congo may show his nature only through a kind of restlessness, and the fact that his eyes cannot be closed after he is dead; or he may not be distinguishable from an ordinary man even to the most practiced eye. And still he is able to bring death with a glance or a touch. If anyone is so evil by nature as to want to become a *ndoki*, there is a way open: he searches out an old man who has "opened the heads of bats," and makes him presents to win his friendship. After several months of ingratiating himself he tells the old one

"I want to become adult."

"But you are adult."

"Not *really* adult." (Heavy wink.)

"Who are your relatives?"

"Such and such a clan."

"Well," says the old man, "hand over so-and-so, and we will eat him together." The novice consents, and by a powerful magic the old man changes them both into ants or spiders, and they come by night to the victim, go into his nose and suck his heart's blood. They return and change back into human shape—but they look like anyone. So the people say, and while nobody has ever seen any of this happen, almost all deaths are caused by this witchcraft, they say, and so of course witches are rampant.

Witchcraft may seem like a strange exhibit to admit to a discussion or religion, especially if it does not even happen. But it does give people a symbolic explanation of some of their persistent ills. If the trouble can be blamed on a faraway witch then at least it keeps blame from falling on friends and relatives. But

witchcraft creates as much trouble within a community as it might
 war or more, as was the case in Salem. Only the Azande of
 the Belgian Congo, who are deeply obsessed with witches, have
 worked out a system of legal etiquette which keeps suspicions
 of witchcraft from having explosive effects.

Gods, and a better world

Witchcraft, shamanism and magic are things we call superstition. They all perform their little services to society, in their alimentary way. They occur everywhere, but shamans and magicians are better able to minister to the needs of small and simple groups like those of hunters, and it is there that you see them standing forth as important figures. Where then do we see what we customarily call religion: the worship of gods? We see it very widely but more in the higher or larger societies of man, of those which are, at least, large communities of settled farmers.

For these more complicated societies have more complicated problems; and mediums and magic workers are not enough. A re-creating of society itself, in another world and in a more ideal form, to which the people can give their strong attention and allegiance, is one way of helping the society here on earth to govern itself by dramatizing its own philosophy. This would be too simple a way of explaining the gods, but it does put them in the light I have chosen to use: as elevated symbols of a supernatural kind by which people round out their conception of the universe, so as to deal with it.

By the same token there is a natural tendency—not a rule—for the more advanced societies to have the more fully developed gods. There are all kinds of gods and spirits, and some of them are nothing but devils, spectral vermin who hang about inflicting damage out of bad temper. They are thus something like witches as cause (meaning an explanation) of ill fortune and sickness; they are not worshiped, but only propitiated and avoided. If the devils are roused to anger by human uncleanness and carelessness,

ness as are the jinns of North Africa, then they are actually on the side of the Lord, because they are an argument for proper behavior, but that is all; they simply exist to enforce a list of do's and don'ts.

The more usual tribal religion has true gods.

You will not find a monotheism of our exalted kind, even if you find some belief in a supreme being, for such supreme deities—creators are recognized even by Bushmen, without any great worship given them. Instead, ideas in advanced cultures run in the direction of a group or family of gods, like those of the Greeks, the Norse or the Hindus. Such are the gods of the churches of Dahomey.

And in Polynesia, where native theology flourished, there was a whole lineage. The universe built itself from chaos, out of the principles of existence—light, breath, thought—and then appeared the first gods, the Sky Father and the Earth Mother. The children of these were the great gods of Polynesian religion: Tane, god of light, of maleness and of the forests; Tu, god of force, of the right side, of war; Rongo, god of peace, plenty, rain and fertile nature; and Tangaroa, usually ruler of the ocean. The Sky and the Earth had other divine children, but humanity was fathered by Tane, who fashioned his own wife, the Earth-formed maid (and that is why woman is earthly, dark, inferior to man). This is the pantheon of ancestor gods, known throughout Polynesia, to which junior ranks were added here and there as the gods' own descendants, the great human ancestors, became gods themselves in one of another of the island groups. The worship of these gods was carried out in temples, with long traditional chants and invocations addressed to them which, reciting past doings of the gods, renewed their mana to perform their special functions for the universe and man.

These gods, and their colleagues elsewhere, are very apt to have their particular aspects of nature and life to look after. They are "departmental," something like the government of the United States, as though you prayed to the Secretary of Agriculture for the good of your crops or to the Secretary of Health, Education and Welfare if you wanted children. Such gods come to personify

various human concerns, and so are symbols of them. But this is certainly not the only quality of gods and spirits. They represent permanence, power and freedom from the restrictions of mortal life, and so they symbolize these human aspirations too. That is what they share with human souls, which merge insensibly with spirits and gods anyhow.

Souls of man and nature

Now the belief in a soul is, like the incest tabu, universal in human culture: man has an inner self, the real he, which can even go abroad in dreams when he is yet alive. Above all, it does not disintegrate at death like the body, but escapes and survives, perhaps forever, perhaps awhile (but at least as long as the living people vividly remember the aliveness and personality of the one who has died). Thus, once more, do people find a symbolic way of rejecting the fear of the end of life, and indeed the impermanence of society itself.

Souls may become gods, then, and in ancestor worship that is just what they do. The Bakongo are those same Congo people who recognize Nzambi Mpungu, benign maker of the world, and who fear the attacks of a ndoki, a witch; they are great magic workers, partly through fetishes; and they have a major secret society with long and terrifying rites of death and resurrection as its initiation. But their real religion is a humble and homely worship of their own dead, the people in the ancestor village, nearby but underground, who are the true owners of the land, animals and palm trees. Only the good, who lead blameless lives and do not die by violence, go to this village; others become malevolent wandering spirits. And these good dead are the ancestors who earnestly wish to see the living people continue and prosper, as long as the living also walk in the paths of righteousness. The living go to the cemetery to speak and make offerings to the dead, the Lukulu, to assure them that the people are doing their best, urging the ancestors not to forget them, but to send game and crops and keep sickness away.

The people, speaking through their own elders, are ~~fully~~ ^{fully} respectful, as they address the souls of men who a few years ago were elders of the village themselves. If departmental gods, like the Executive Branch, then the ancestors would be like the Senate, made up of older men who do no wrong and are chosen to be wise, just, dignified, merciful, heedful of the good of their supplicant younger brothers. Like this imagined Senate, the Bakongo imagine another village, living by the cultyre, but purged of the bad side of life. To that perfect ~~ideal~~ ^{ideal} they try to draw near themselves. This may idealize their point of view. But we see nonetheless a cult which, much more than shamanism or magic working, is a social conception.

Nor is a cult of this nature absent among the hunting peoples, though it is hardly common. Look back at the totemism of the Australians, who link their own souls and those of nature through totem ancestors. This shows us one more important thing about culture: that it is really all one, and not carved neatly up into compartments of "economics," "society" and "religion," as we tend to it when we look at it. It has these several natures, but they flow into one another over such boundaries as we make.

We think by the logic of Aristotle and the geometry of Euclid. But the Australians think by totemism. They themselves are totem souls incarnate. Their societies—their clans and marriage groups—are ordered and kept in mind by the totems they belong to. The past is the story of the totem ancestors, the present is the knowledge of the totem places of the country, and the future is the bringing forward of the past in the ceremonies which repeat the totem time of the myths, ensuring that the world will go on in the totemic way it was made to go. This is no childish matter, and the natives are not children: the myths are extensive and might take a man years to learn a large body of them, the stories and ceremonies are intensely sacred; and the whole provides a philosophy to which the natives give much thought and care, which they take much comfort. For the present is joined to the past, and man is joined to nature, and there is unity in life because of the totems.

16] Inventions and changes

Culture is all one.¹ And a given culture—that of any particular people—hangs together² also. If the culture of the Australian natives gives them a unity in life, it is because their culture has a unity in itself.

I do not mean the unity flowing from the stage of the culture,³ or its background. Hunters all tend to be nomadic, to have few material possessions, to lack temples and priests, and to depend considerably on magic. Naturally they do: their way of life demands most of this, and they cannot support a full-time priest, free of the duties of getting his own food, as a farming people might. And pastoralists living in the Asiatic steppe, and depending on livestock, do not surprise you when you see that their houses are portable and that their culture has rather a milk-and-wool note to it.

Apart from such obvious influences, however, any culture, of whatever level or region, is apt to have a certain consistency and internal harmony. At any rate, no culture is ever a hodgepodge of possible things, as though we used wooden forks, copper knives and silver spoons, or as though the art of a given moment were strongly religious in painting but abstract in sculpture. Ruth Benedict put forth the view that a culture may almost have a personality of its own, meaning that its institutions and its sense of values will pick one possible kind of temperament, out of those which are present everywhere (violent and excitable, or reserved and careful, or aggressive and boastful); and by making this the admitted, rewarded type of person, will thus have marked effect on the social behavior of the whole.

The people of Dobu, an island group within the kula ring of Melanesia, are, for example, especially mean, and suspiciously jealous almost paranoid, compared to most Melanesians. A Dobuan will behave in shyster fashion in the kula, receiving a paved necklace and then allowing more than one of his trading partners on the other side to understand that this necklace is coming to them when they visit. Thus he manages to get presents of several major bracelets from the opposite direction which he will not be able to requite in the expected time, but which add to his own prestige all the same. Dobuans put trust only in their own brothers, which does not include their own husbands and wives. They cannot believe that one spouse will be faithful out of sight of the other, and marital discord is merrily fostered by their unusual rule of having newlyweds change yearly from living with her clan to his, so that one of them is always at home in family secrets and gossip, and the other is held at arm's length and spends the year thinking how to get even when the places are reversed. This disposition is reflected in one aspect of the culture after another, and fear of black magic is rife.

Such interpretations of culture have been pushed a step further, to suggestions with a Freudian basis that all the individuals of a society are molded (not merely persuaded by cultural example) toward one kind of personality or another. Here the cause of the ruling personality type is sought in childhood and infant experiences dictated by the culture, such as the severity with which children are housebroken, and other practices which make them feel secure or insecure in general. From this have emerged attempts to paint whole modern nations in a single color, giving the secret of "the" Russian or "the" American with his alleged mother-fixation and father-rejection. Most students feel that this step is a little headlong.

But at the same time it would be wrong to throw out the baby with the bath water and fail to see the great and inescapable force of culture in showing the way for people to act. I do not mean, of course, the simple rules it makes for marriage or its other outright institutions; I mean the tone it sets. There is no question that our

own culture endlessly suggests to us that we should all "succeed" and "get ahead" and admire the hard competitor. Now it seems certain that, as card-carrying Primates, we have a degree of natural competitiveness in us anyhow, yet not all human cultures require one to "succeed" in order to be content, but only require one to conform.

Furthermore, there is a degree of conflict in our cultural ideals. Our powerful philosophy of competition certainly acts to release a tremendous amount of human energy, and has put us where we are. At the same time we bridle it with another powerful philosophy, the ideal of meekness, restraint and turning of the other cheek, which is so honored that it is the essence of Christianity. Thus our culture has stresses and strains. No matter how hard we vie against one another, we must be all moderation and good will when we are face to face. (Automobiles have put us in a position to vie with other people without having to meet them face to face, and we have not yet worked out an etiquette to control things. One of the prominent automobile manufacturers can advertise that its latest is "Designed & Engineered to stay ahead of other cars," not merely speedy, comfortable or safe. Once behind the wheel, the hobnailed side of our culture finds a clear field. The baboon in us decides to have some fun, tears up the New Testament, and sets off down the highway, hogging the left-hand lane, to see how nearly he can miss an accident.)

In spite of such contradictions, our culture does argue the existence of important themes. Other cultures do the same, and usually have a greater harmony in their themes. Not only that, but different parts and institutions in a culture fit together and take on a common coloration. The lobola is one institution, itself formed from others. So is the kula, as Malinowski clearly reported: it is a complex integrated institution embodying social position, magic ritual, ordinary trade, and relations between islands, even though the natives themselves do not see it as a single whole, but only as various bits of known behavior affecting them as individuals. This is the kind of coherence toward which an

entire culture trends, though achieving it only partially, and to a greater or less degree at different times in its history.

This brings us to the process, the question of how this may come about. Obviously, to fit its parts together, a culture must have some choice of parts—it must be able to select, among the possible ways of meeting a problem, the way which best goes with the other culture traits—and it must be able to modify any such parts to fit the other parts. And this brings us in turn to the whole matter of how culture changes and progresses.

Now it should be realized that change and progress are not the same thing. Some change is mere change. Fashions shift, and clothes may get less comfortable rather than more so—look back at the wasp waist. Pottery styles, the archaeologists know, have changed constantly over long periods. We think very well of change and progress in America—in material things—but others do not share this love. Independence of thought and action is looked on with suspicion among the native Australians, who prefer to decide things jointly and to be guided always by the past. And there are other forces hostile to change in every culture, mental and physical habit. People depend on their own culture, the one they grew up in, which showed them how to act and how to do things. Naturally they rely on this as *the* way things should be done, and are apt to be upset if they are forced to change.

But culture, remember, is the mental patterns of a whole society, not something that is found in a book or as the property of one individual. And this fact cuts both ways. One generation teaches the next, but there is many a slip 'twixt cup and lip, and the learning may not come out quite as the teaching intended. Culture could stay exactly the same only if everyone copied everyone else perfectly, and nobody ever forgot anything, got bored, got curious, or had a new idea. And, that is impossible. Little novelties slip in, for no two people are just alike, and the novelties may be liked, tolerated, or simply not noticed. Thus accents and fashions continually creep in some direction or other. And, since human beings are really far from stupid, more important new ideas are bound to come along. Change and progress do take

place. A new idea comes to a group in one of two ways: either they think it up themselves, or they borrow it from people who already have it. These two things are called invention and diffusion.

Invention, or something old, something new

When we think of invention, we think of Thomas Edison, or another man whose face is on a stamp. We are apt to believe that we struggled along without some vital thing until such a genius gave it to us. But it will not detract from the inventor to say that culture itself should get more credit, because almost all inventions depend absolutely on what exists already. They are apt to become vital after they are invented, but they cannot arrive until the culture is ready for them. Quite apart from having the necessary knowledge, people must be able to receive and use them, or they will fail. On the other hand, if there is a place and a need for them along with the proper resources, they will almost invent themselves. This would not be easy to show for primitive cultures, although such a thing as the appearance of weaving with settled life is suggestive. But our own history illustrates the point well. We know Da Vinci sketched several flying machines but could go no further, lacking the power necessary; and doubtless flying could have been nothing but a stunt in his day anyhow, without the navigation or the commercial uses of today. Much of the humor in Mark Twain's *A Connecticut Yankee in King Arthur's Court* turns on this very idea.

On the other hand, it has often happened that two men have made the same invention at the same time, simply because it was in the air. Kroeber¹ has written at length about the whole business of invention and culture, and assembled a striking list of simultaneous discoveries, including the telephone, the telescope, photography and the planet Neptune, in each case produced by two or even three men within a single year. The classic example is that

¹*Anthropology*, p. 342. See also Ralph Linton, *The Study of Man*.

of Mendel and his laws describing the non-blending nature of inheritance. His was no accidental find, or even a bathtub inspiration like Archimedes'. He knew the problem he wanted to study. He chose his plants for crossbreeding with care, and he kept a detailed account of his results that gave him his answer: it was the model of a scientific experiment, and he announced the result in 1865, publishing it a year later. Modern biology and agriculture are unthinkable without his findings (except for the unfathomable aberrations of Russian political genetics), and yet in that day's work, duly published, had no effect at all. In spite of the direct link in Darwin, and of biological advances in general, the biologists were somehow unready to use Mendel's find. Then, after he was forgotten, biology at last began to catch up with him, and in 1900 three men, working in different countries, all reported having rediscovered Mendel's laws for themselves. While experimenting, each had come across Mendel's old work and acknowledged him as the pioneer. And genetics, which was established in this way, has ever since moved steadily to the center of biology. "The stone which the builders rejected, the same is become the head of the corner."

There are, then, the inventions for which the time is ripe, and the inventions for which the time is not ripe, to say nothing of the inventions for which the time will never be ripe, like the top hat out of which pops an umbrella at the press of a button. Good cases are known of native inventors producing the right thing at the right time, such as the now popular black-on-black (actually matte-on-glossy) pottery invented by Julian and Maria Martinez of San Ildefonso Pueblo. It is better to use examples from our own civilization simply because the complexity of the simultaneous inventions, and the distance between the inventors, dramatizes the importance of the cultural background. (The first person who says "telepathy" goes to the foot of the class.)

Inventions follow the bent of a culture, as all the foregoing implies. Any idea which did not have meaning in the existing state of affairs would be like a bird laying an egg in a nest that is not there. And people are apt to invent significant things by improv-

ing on what they are already doing, rather than by sitting down to plan how to get to the moon. Thus most inventions are minor. And a major invention may need a number of minor improving inventions before it is satisfactory. I have already shown how pottery actually called for a number of technical discoveries.

Finally, a minor invention may turn out to be a major one. Suppose—and it is entirely possible, since the gadget exists—that the original how was a small thing really used for making music, by holding one end in the teeth like a jew's-harp while the string was twanged. The first man who decided to make a weapon of it—not the first man who ever propelled a stick or a pebble with it, but the first who saw what this meant—was certainly one of the great men of the end of the Paleolithic.

Some forward steps can hardly be looked on as single "inventions" at all. Thus domestication of plants was probably a long, unconscious process and not an isolated discovery. And who invented the automobile? What does an automobile consist of? The motor? The coach part? Or the gasoline, or the rubber tires, or the smooth roads? All of these are necessary, as was found to their sorrow by those who tried to make automobiles a hundred and fifty years ago: they were forced to give up, put their automobiles on rails and call them railroads. And yet we now look on the automobile and on domestication as unitary things, and we understand that they are two of the greatest contributors to change that man has ever seen.

The appearance of material inventions can be traced, in history and even in archaeology: if the Martinez family had lived before the last century or so, the first signs of their pottery style in prehistoric sites would have been spotted as a new invention by archaeologists. But other kinds of invention are harder to study. Religions, we know, have sprung up and succeeded time and again, always providing they had some kind of fertile ground to grow on. And of course they tend to follow older, acceptable patterns. The ancient Near East and India especially have been kind to them, but we ourselves are surprisingly tolerant. The California kind of extreme oddity, worshiping Aphrodite or wear-

not lion skins, does not get far with us, but any cult which calls itself Christian may do well, even if it rolls on the floor and shants. But socially and economically we are terrible old men. Say "planner" about an engineer or a businessman, and you mean he is forward-looking; say it about a New Deal politician and you mean he is just plain visionary, and dangerous.

This tendency to dive under the bed at new economic and social proposals, or to try to exorcise them with magical phrases like "keeping socialism," may be especially strong in our culture, recognizing the proven worth of our present institutions. And yet it is really not in the least odd, because social institutions are nowhere "invented" like material things. Social changes take place largely without conscious direction, by an unrealized process of joint consent. Our institutions made our laws and our Constitutions, more than the other way around. There is no sign that social forms arise by any other methods among primitive peoples. Of course the people may say that the gods, or the totem ancestors, ordered things to be the way they are: that is one of the duties of religion.

If the workings of inventions in the social side of life remain obscure, it is worth noticing that we ourselves have gone to the other extreme in the scientific and material side. We have taken invention into our own hands and away from chance as far as possible, for the first time in history. The universities and the great industrial laboratories have concentrated the men and the means for invention and discovery; and in our own lifetime the day of the lonely genius in his garret workshop, or even of the Fords and the Edisons, seems to have gone for good. There will be men as great as those of before, but they will not be lonely. Edison invented the electric light, but color television has been invented several ways, by whole teams, to order. And what about the atomic bomb? We have, also recently, seen the same kind of change in diffusion. We have made a business out of something which once took care of itself, and we call it advertising.

Diffusion, or something borrowed

By the nature of things, there is less honor for people who diffuse ideas than for those who invent them, for diffusion is typically a more social process. But it would not do to give too little notice to this second main source of culture growth. Comparing it with invention would be like the futile comparison of heredity and environment, but its importance is enormous. An invention would be of little use if it were not spread around, and much of its significance depends on the degree of its diffusion. We may never know whether the Levallois flake-making technique was invented in the Lower Paleolithic more than once, but we do know it covered a great part of the Old World. We are pretty sure that domestication of grains took place in the Near East, and we have seen the spread of this. And we need only reflect that our own religion, writing and mathematics all came from the Near East to understand the meaning of diffusion to our present civilization.

Theoretically, something invented once may at last, by diffusion, become available to the whole world. Actually, this very question is one of the constant problems in studying unwritten history. Two things that are much alike are found thousands of miles apart in different cultures. Is it diffusion? The importance of trying to decide whether there was some actual contact or trade between the peoples involved, or whether each developed the same thing for themselves, is obvious. But so is the importance of being reasonable about it. There have been far too many authors who have got the diffusion bee in their bonnets, been carried away by a few likenesses, interpreted all other facts in the light of their own conclusions, and decided that there was not only diffusion but migration. Such imaginings have transported American Indians to Polynesia, Polynesians to America, Harappans to Easter Island, Egyptians to Asia to the Pacific to the Ohio Valley, and people from the lost Atlantis to every place that ever showed a sign of civilization at all.

The anthropologists have usually been so busy fending off the most unrestrained of these romancings that they have had difficulty in taking a serene attitude toward the problem themselves, and have usually been most suspicious about possible long-range delusions. Certainly the only thing to do is to judge each instance on its own merits, and not in support of some conviction that the American Indians are the Ten Lost Tribes of Israel. It is an interesting fact that the hot-eyed authors who trace connections between the ends of the earth are usually writing about moldering temples and legends of White Gods, rather than about humble, more matter-of-fact and sounder evidence from the daily life of people.

Take blowguns. A blowgun is a fine weapon for hunting in the forest where the air is still. You must have a strong poison, for your dart is small. But it can be shot accurately (disturbing game as little as possible) and with a good deal of force, if the gun itself is long enough and can be kept from bending too much. Blowguns are very popular in Southeast Asia, among the Semang, the Sakai and the Malays of the Malay Peninsula, and in various parts of Indonesia, especially Borneo (although Sherlock Holmes made a wrong deduction in thinking they are used in the Andaman Islands). And they are also popular in the forests of South America. In both places they are as long as ten feet, and occur as simple hollow lengths of bamboo, or as inner tubes strengthened against bending by an outer tube, or as a wooden pipe made from two halves which have been split, grooved and put together again. They shoot light darts, fitted to the tube with a wadding of cotton or pith, and tipped with poison (especially ipoh sap in Asia, and curare in South America, both strychnines). And they are shot the same way, holding them close to the mouth, and shooting on the drop.

Such things are found nowhere else. Is this not a strong argument that some enterprising Borneans, let us say, loaded up a canoe and set out across the Pacific to America? Or, if you prefer, some of the Amazonian Indians went in the other direction? But is this really likely? Borneans are quite unequipped to cross

the whole Pacific. Blowguns would have had to move east by stages, and to appear in Polynesia, if they were useful enough to be taken along at all. But it is too windy for the darts in Polynesia, and there is no poison, and nothing to shoot. Suppose the gun nevertheless arrives in South America, on the west coast. Here and in the highlands it is too windy, and there is no poison, and nothing which cannot be shot better with bows. So, unless you can imagine some people like the Borneans, simple in culture (those of higher level do not use blowguns), getting to the Amazon Basin in one generation, before they could have forgotten just how blowguns are made and used, then you can only suppose that people had the wit to invent them separately in the two parts of the world.

But how does that explain the many likenesses in making and use? The answer is that these likenesses are natural features of a blowgun, and the natural best ways to use it. And poison happens to be available in both places. In fact the use of a blowpipe has spread well outward from both its centers (as far as the Iroquois in America) but, although it can kill a tiger in Malaya, it turns into a toy beanshooter or an unimportant dart shooter of little effect when it is away from poisons and forests.

The case of the blowgun has long been argued, but no conclusion seems plausible except two independent inventions. And if the blowgun traveled across the Pacific Ocean why did it not travel along the Indian Ocean to the Congo forest?

On the other hand, such things as tobacco or the alphabet are known to have spread from one source: we have their history, and their distribution is what you might expect. And therefore when a group of similarities is found between the Paleo-Siberians and some of the northwestern Indians, just across the Bering Sea from one another, and including such thing as a series of myths in which the Raven is a major figure, the argument for diffusion is irresistible.

But most of the puzzles are not so clear-cut. So diffusion suggests certain rules. Obviously, the closer two tribes having the same thing, the more likely they got it from the same place, or

one from the other. Obviously, the more things they have in common, the more likely that they have had contact through diffusion. But the more a group of details exist together because they are tied together by necessity (the blowgun being no good without poison, wadding for the dart, etc.), the less the argument for diffusion; contrariwise, the less natural connection among the different details of a thing (like the events in a story or design, in art), the less the chance of the whole having been invented separately twice.

In Kipling's *Namgay Doola*, when the teller of the tale finds the obstreperous villager in the Himalayas, whose hair is red and who sings, as a hymn his father taught him, a chant which is almost the same in words and music as "The Wearing of the Green," his suspicions as to where that father must have come from are overwhelming. He hardly needs to see the brass crucifix and the ancient regimental badge as well. But in the hidden history of human contact and migration, one cannot be too careful.

One must also consider the nature of the culture traits under consideration. Material things diffuse easily enough where contact is possible, but with limits: blowguns do not travel in the plains, and heavy fur clothing does not migrate to the tropics. Religious notions spread with ease, and stories and myths, which are light luggage, with the greatest facility. Traits of social organization, on the other hand, seem to be the poorest travelers of all.

Cultures pick and choose

Diffusion and history are interesting, but let us get back to diffusion and culture generally. Diffusion is the faster way of building cultures, because if three men each make an invention and all exchange, each has got two of the new ideas by diffusion and one by invention. And, theoretically, one invention could travel everywhere. But diffusion is not like sound waves, going in all directions at the same speed. It is really a complicated business.

the mechanical side of it, which I have just been considering, is of less consequence than the social and cultural sides.

Acceptability of something new is an important factor, in diffusion as in invention. And an important factor in this, in turn, may be the status of the people who have the new thing, as against those who are being exposed to it.

Paris has a well-deserved reputation in fashion, and as a result people are automatically receptive to what Paris has to say every year: that is the direction from which they expect diffusion to come. The primitive world has the same feelings: in northern New Guinea the Arapesh-speaking people who live in the mountains have come to consider themselves very much as hillbillies compared to their tribesmen on the coast, who are in the stream of traffic, which is also the stream of diffusion. The mountain people go down to the coast to learn new, complicated costume dances for which they humbly pay the coastal slickers a pretty penny, and then bring them proudly back to the mountains. To make up a dance themselves and try to sell it on the shore would never enter their minds. Testimonial advertising is hardly different: a movie star whose taste buds are about the same as yours nevertheless carries a lot more weight when he states, on the back of a magazine, how much better is the taste of the cigarette which bought his testimonial.

But acceptability in the main rests with the accepting culture. For example, the Ghost Dance of 1890, which started up among the Paiutes in Nevada, was carried by Indian missionaries to a great number of different tribes all over the west. In northern California, where the Ghost Dance of 1870 had been popular, it was therefore not a new thing in 1890, and had no success. It was taken to the Hopis in Arizona, but to their sedate culture, tuned to a complicated, priestly, highly ritualistic religion, this new cult, rather vehement and shamanistic, seemed like rubbish and was without effect. The Sioux of the Plains, however, were feeling the doom of their free buffalo-hunting life, and the aftermath of the Custer affair, as well as disease and poverty on the new reservations. The Ghost Dance, promising return of the dead Indians and

the disappearance of the Whites, and sharing with traditional Sioux religion a strongly emotional quality, was accepted less easily, and this was a factor in the disturbance which broke out about the death of Sitting Bull and the Battle of Wounded Knee. Thus the diffusion of the Ghost Dance was rapid, all in about a year, affecting or skipping large areas, and it struck its greatest spark far from its point of origin.

We are now back where we started, at the internal harmony of a culture. Invention, but particularly diffusion, provides it new ideas to choose from, and it will choose those which do not violate the general nature of the culture itself, and will reject those which might. By picking and choosing it has the chance to maintain its integrity. Furthermore, a trait which is handed over by one people to another (in any of a dozen ways, war included) may even look different to the giver and the taker, because of their backgrounds. A harpoon is a harpoon, let us say, but a five-gallon gasoline can may also make a good raft float to people who have no gasoline. This would be particularly true of religious ideas, which would be nearly impossible to convey in their exact meaning between different people, so that even Christianity has undergone some strange modifications among its wilder converts. And when a new idea has made its way in, then it is almost certain to be squeezed into a different shape, as much as is needed to suit it to all the old ideas already present. Again, it is like Paris fashions: what finally appears on the streets of Peoria is not what was first unveiled by Schiaparelli, but only that degree of it which seems just right for the streets of Peoria. And the Bikini bathing suit is an example of something that was not acceptable on this side of the water at all, except in newspaper pictures.

Integration, and what happened to the Tanala

So a diffused idea, in so far as it is accepted in the first place, must be integrated with the accepting culture so as to be used.

istent with it. But this is only the second best proof of the consistency of culture. For the integration of the culture itself is such that a new trait, in finding its place, may in turn send waves of change throughout the culture, as the existing traits in turn become adjusted to the new one. What happens will depend on the importance of the new trait, of course. A fine illustration of this has been given by Linton.²

The scene is Madagascar, the island neighbor of Africa, which has nevertheless been strongly affected by Indonesia, all the way across the Indian Ocean. The tribe is the Tanala, studied at first hand by Dr. Linton himself, who was able to piece together some interesting happenings of the last two centuries. This tribe was living by a simple pattern I have already described for Indonesia: isolated villages growing dry rice by slash-and-burn methods, and moving approximately once a generation when they had used up the nearby jungle soil. Like the simpler Indonesians, the Tanala knew their tribal affiliation, but there was no tribal organization, and even the village head man was only a sort of moderator, with the elders deciding affairs.

So rustic was this culture that there existed neither slavery nor the social classes visible in Southeast Asia, nor yet the differences in wealth and property which go with social class. On the contrary, they were particularly democratic and simple: they had ideas of private property but not as applied to land. For on establishing a new site, the village elders simply parceled out jungle to the several joint families making up the village, each of which thus ran its own farm. If one family turned out to have poor land, the elders would adjust things the next year, so ordinarily all joint families were equal in resources.

Along came one new trait: wet rice. This must grow in damp ground, but it yields better than dry rice, and through more of the year. But there would be only a little valley bottom in the plot of each joint family, not enough to keep all its members busy, so the typical joint family simply detailed one household to see to the wet rice. Shortly there arrived the idea of terracing, the general

Eastern practice, to increase and maintain the plots of wet rice. So the wet-rice households built terraces and repaired them. Inevitably this tended to detach these particular households from the joint families to which they belonged and with which they had always worked co-operatively. Thus, when the dry land gave out the main body of the joint family would say, "Let's move," and the household which had gone to such trouble over the terraces would say, "Thanks, we'll stay." For the terraces and the wet rice would go on yielding indefinitely.

So when the village moved, according to the old system, it was split in two. Not only that, but it did not simply leave some of its joint families behind and take others, which would merely have resulted in two independent daughter villages, each like the mother. Instead, the joint families themselves—the basic units—split apart, some households going to a new village and some remaining.

What now of village isolation? Households thus began to have important relatives in other villages, with whom to gather for ancestor worship; and the marriage pattern also, especially with some preference for cross-cousin mating, brought marriages between villages which had once been endogamous. Villages became permanent, not transitory, and instead of a simple stockade they began to have a kind of heavy fortification copied from another tribe. This changed the war pattern from general attacks for cattle and women to seizing of stragglers for slaves. Slavery came in; wet rice would support it as dry rice had not. So did social classes; for terraced land, the end of so much labor, became private property, not something to be called in and redistributed by the elders, and land thus became wealth, to work with slaves. The joint family was no longer the main unit; clans, also present before, grew in importance. Finally the head of a leading clan declared himself king, now ruler of most of a recognized tribe, of socially related, strong villages. King, classes, wealth, slavery, tribe, village, and social organization all came in or changed in nature, after wet rice knocked at the door and was welcomed.

This chain of cause and effect is not at all unfamiliar to students

of our own society. The automobile alone, for example, has not yet stopped doing to us whatever it is that it is doing, and it has done a great deal. It is just that the Tanala, a small society in a single place, will let us see much better the whole history of such a process; we can, so to speak, take it into the laboratory and study it. It shows admirably the integrity and the fluidity of a culture in the way it responds to change, so that the life and nature of the culture maintain themselves. This only begins to be strongly evident among the larger societies of a Neolithic level, for among hunters there was obviously little new and little change.

Finally, it is because a culture hangs together that it sometimes falls apart. That is the key to what Europeans have done to native peoples. With muskets and money they have forced on other cultures things that these cultures could neither reject nor assimilate, and so have destroyed the integrity of such a culture and the self-reliance of the people. With the best will in the world, the Europeans have knocked over the idols which were the carefully fashioned props of those societies, and have tried to substitute Christianity, the prop of ours. Without the coherence of their old way of life, such people have often lost direction and become dependent, giving a totally false impression of lazy and shiftless savages. It is nobody's fault and everybody's misfortune.

17 *The oldest Americans*

One time, while the late Ice Age hunters of France waited for big game by the caves in the Vézère Valley, a similar band of hunters was moving eastward in the far corner of Siberia. They too were looking for game, and in the search or in the chase they moved over a narrow neck of land. They may not even have realized that it was especially narrow, and there were several other things they did not know. They did not know that this particular neck of land would be covered as the sea rose, much later, when the glaciers melted. They did not know they were entering a whole new world, splendid with game animals: mastodons, mammoths, horses, camels, long-horned bison, musk-oxen and such oddities as the giant sloth, to say nothing of elk, moose, caribou and deer. They did not know they were the first Americans.

They could not have felt particularly prosperous. They fought the cold, while the ice of the fourth glaciation covered much of Asia and North America (though not all of the Bering Strait region or the coast of Alaska), leaving them only certain passages by which they could move into the open continent below. They were doubtless one isolated horde out of the scattered hunters of the Far East, and belonged to the Mongoloid branch which had not been remodeled in face form either because they came over too early or because the unknown area where this remodeling took place was not adjacent to America. But they were the first of a series of such parties, no doubt differing in detail but alike in general culture, which wandered into America for a good many thousand years, until the water at last rose and Bering Strait could no longer be crossed by accident. They cut themselves off

from the Old World and populated the New. And that is a fave they have done to the study of human history. For they went to work and duplicated, in the Americas, the same general steps of culture advance as were being gone through in the Old World.

Nobody can say today with any precision when this first entrance was made, but it doubtless corresponded with the European Upper Paleolithic in time and nature. It was not extremely ancient; no credible signs of humanity, at any rate, have been found in America from before the fourth glaciation. At the same time, various radiocarbon dates show that man must have been here no later than 10,000 B.C. (well before the European Mesolithic), and according to the same method some material from the lowest culture level of the Sandia Cave, in New Mexico, apparently reaches back to the neighborhood of twenty thousand years ago. This is striking but not surprising. Such an age for the first Indians is now acceptable to the archaeologists, and perhaps an even greater one, on the order of forty thousand years.

The new Americans would probably have gone along the arctic shore of Alaska at first, and then found their way south between the glaciated mountains of the west and the great Laurentide ice sheet of eastern Canada. Gradually they occupied all of the hemisphere. It was no constant trek: hunters are nomadic, to be sure, but they move around in the land they know and to which their style of hunting is suited, and only slowly do they venture into new kinds of country calling for any change in their way of life or in the food they rely on. And this itself argues great antiquity for the first Indian immigrants. For some of the hunters had already reached the bottom end of South America, and were eating horses, sloths and guanacos, in the year 6689 B.C. (plus or minus about four hundred and fifty years). This is the estimated date determined by radiocarbon from the very meat bones they left, in a fireplace in the Palli Aike cave. And these are not the earliest remains in that cave.

Even before this, one day about 10,000 B.C., an Indian was hunting mammoths around the swampy edge of the lake which then filled much of the Valley of Mexico. (It was the end-glacial

parent of the lake where the Aztecs lived, and of which only a remnant now exists.) This Indian somehow became mired, or drowned, and fell on his face, and was evidently partly eaten by vultures. Here at Tepexpan, northeast of Mexico City, his skeleton was found still lying on its face, under the now dusty bed of the



Some of the ancient sites and cultures of man in America

lake's edge, and in the same late glacial layer as two nearby mammoths who had met a similar fate. If there might be any doubt that the man and the mammoths were there at the same time, or any suggestion that the human skeleton might have been artificially intruded into this layer by burial (and there were no such signs), they were dispelled later, when another pit at Ixtapan, two miles away, revealed in the same layer the butchered remains of

mammoths with no less than six assorted stone knives and points among the bones.

The same melancholy end seems to have overtaken the Minnesota "Man," a damsel of fifteen who drowned in a lake at the glacier's very edge, if the signs can be believed. She lay, apparently within the lake gravels, at too great a depth for a grave, and she was not lying in the position of a buried body. But in this case the excavation of the skeleton was accidental, being made by a road scraper and not by the trowel and camel's-hair brush of the archaeologist. And so the clear evidence of age which may have existed, in the form of undisturbed layers of gravel directly above the bones, was thoroughly destroyed. There is no great reason why the Minnesota girl might not be old, but the proof of age is not good. And the same might be said of the Punin skull of Ecuador, and of a variety of would-be ancients: some of them may indeed be old, but the present evidence is not airtight.

Just now, the Tepexpan Man reigns alone. What does he look like? He looks like an Indian, and so do the various pretenders; and one may only remark that many of them were of one general type, with long heads, not large brains, slightly projecting teeth and no particular racial stamp; perhaps a little less "Mongoloid" than most Indians of today.

But we do not need such finds as proof of antiquity. There is the Sandia radiocarbon date, and others more numerous and reliable somewhat later. And here and there, in many places, crude stone and bone tools have turned up, either with various extinct animals, or else in other circumstances suggesting glacial age, such as their presence in old Canadian beach levels from a time when lakes were larger or higher. Some of these finds may turn out to be very old indeed (within the fourth glacial phase), and in general they give an impression of the spreading variety of the early hunters. There is too little of this material just now to create much of a general picture.

However, more definite cultures seem to emerge, perhaps 10,000 B.C. or earlier, especially with the general use of a large dart point, often with a fluting or channel running up the sides



A "Clovis fluted" point



A Folsom point

from the base, made by a large chip skillfully struck off. This point, called "Clovis fluted," looks like an American invention, and was widespread. By at least 8000 B.C. another culture existed, flourishing especially in the Great Plains, that of the Folsom hunters who made a particularly graceful form of fluted, broad-headed point, and who hunted the large extinct *Bison taylori* with dart and spear thrower. By perhaps 7000 B.C. a third style of point was dominant, long and slender, without fluting but marked by even cross-flaking in the "Yuma" style, somewhat reminiscent of the European Solutrean but of course having nothing to do with it.

The Mesolithic in America

The ice was receding now, and the climate which had supported the great game animals was undergoing various changes in different places. Many of the animals themselves were disappear-

ing, perhaps because of these changes, but certainly hustled into extinction by the Indians themselves as well. (Both the ice and the animals lingered longer in North America than in Europe.) And it seems clear that the effect on the hunting cultures was like that in Mesolithic Europe: localization. Game became rarer and smaller, and the Indians must have studied the resources of their different regions attentively, learning what there was to be gathered, how to find it, how to prepare it for eating.

There is evidence for this sort of thing in the still spotty record: the Cochise Indians of Southern Arizona and New Mexico had a continuous culture of several thousand years which evidently depended strongly on the gathering of vegetables^s and seeds, which they ground on stone slabs. This is the process which must have produced a great many local and special cultures of hunters and gatherers all over the Americas, such as that of our own recent Great Basin Indians, between the Rockies and the Sierras, who made staple foods of piñon nuts, grass seeds and grasshoppers, or that of the people of Tierra del Fuego which I have already mentioned, where the Onas and the Yahgans had two quite different hunting systems (shore and shellfish vs. upland hunting) in the same general area. The Yahgans probably invented canoes independently. Elsewhere, also, all kinds of little discoveries and adaptations were made. So there is indeed a suggestion of the Mesolithic of Europe, and "Mesolithic" is what we might best call these later American hunters.

But everything to this point looks only on one side of the story, the Paleolithic pioneers and the cultures descending from them. There is another reason for talking about the Mesolithic, meaning an imported variety, not the domestic one. Now the first inhabitants of America walked into their new domain dry-shod, and so did their successors for an unknown length of time, probably sporadically but continuously, until the bridge was drowned by the rising waters of the Bering Sea toward the end of the Pleistocene. This does not mean that nobody ever crossed again, but only that boats were now necessary, and that the people crossing would probably be skilled boatmen. And this in turn suggests that

the pattern changed from migration to contact: that landsmen coming over in the course of the hunt, and marching off into the interior, gave place to people accustomed to shore and water, crossing back and forth here but not going on into America readily for the very reason that they were shore people by culture. This is supposition, but other facts argue that the bulk of the population goes back to the Pleistocene comers. One such fact is the absence of tribes (other than the Eskimos) uniformly showing the strongly Mongoloid racial form of present-day eastern Siberia.

Nevertheless new things did arrive. Microliths—pygmy blades—of a particular kind, a Mesolithic trait in many places, have been found in both Mongolia and Alaska, much alike, and those in Alaska are thought to go back to about 4000 b.c. A little later, before 3500 b.c. a new hunting culture had appeared in the woodlands of the eastern half of the United States, with polished stone woodworking tools, and this also is believed to have marked connections with Asia. Much later the Eskimos took over the north rim of the continent, evidently having come direct from Asia themselves. And finally the modern Indians of the Pacific coast have a rather special kind of culture, strongly related to its habitat to be sure, but with mythological and other likenesses which bespeak some kind of contact with Asia which is considerably more recent than the original immigrations. Thus much of North America has had food-gathering cultures which reflect different impulses from the old country, even though they are mostly native in their development. Let us look separately at Pacific, Arctic and Woodland, for they are very different.

The fortunate gatherers of the west coast

The people of the Pacific shore, to begin with, take the rule about hunter-gatherers being nomadic and break it into little pieces. Even farmers using slash-and-burn agriculture usually must move their villages periodically, but along the Pacific the sources of food were so dependable that the people could build

villages of "Neolithic" size and stay in the same place ~~contin-~~,
ously. And this, naturally, allowed a "Neolithic" kind of ~~socie-~~
organization.

In California a main staple was the acorn, and since nuts flour-
ish in California this food was plentiful and easily kept, requir-
ing only to have its meat ground and soaked to take the tan-
nac out in order to be made into bread. Salmon, rabbits and deer
were other main foods. So satisfactory were their natural foods
that the Californians practiced no agriculture, though it must have
been available to them by diffusion, and they actually did grow
some tobacco. They may have been almost completely resistant to
pottery for a similar reason: they were the world's best basketweavers,
producing finely woven baskets which would hold water, fancy
baskets with feathers and beading worked in, and even making
some examples the size of a pea, just to show what they could do.
The women wore basketry skullcaps for hats, but otherwise dress
was informal, of skin; and weaving, along with other arts (except
for some remarkably fine chipped obsidian blades), was lacking.
They used the sinew-backed bow in hunting, and made cere-
monial earth lodges partly underground; this kind of house is very
ancient, and both things run over into Siberia. They had shamans,
brothers to those in Siberia. Religion otherwise consisted largely
of a long series of dramas and dances enacting their mythology.
These and games kept the people busy during the winter after the
nut harvest, and strengthened social contacts, in the same way as
feasts or the kula in Melanesia.

North of California, up the Northwest Coast to Alaska, there is
a complicated shore of inlets, sounds and islands bearing a growth
of magnificent timber, especially cedar and spruce. From the
Salish in the south through such people as the Kwakiutl and the
Haida, to the Tlingit in the north, the people have a striking cul-
ture and a vigorous art, both notable for their work in wood. They
live in villages along the shore in large gabled houses of plank-
ing, with totem poles either forming a corner post or standing out
in front. They use dugout canoes which, for war, may hold up to
fifty paddlers.

Nowadays they work in canneries, but they used to support themselves on the bounty of the sea, especially on salmon, but also on halibut, herring and cod, all taken in a variety of ways, and on clams and oysters. Drying and smoking allowed them to stock these foods for the whole year, the key to a settled existence. Seals, porpoises and whales were also killed; berries and roots were the main land foods; oil was made by putting quantities of oolachan, a small fish, into an old canoe in which water was boiled with hot stones.

The culture has its oddities, compared to other American Indian cultures. It has the Raven myths, composite bows, and body armor made of rods, things also found among the Paleo-Siberians. It lacks (or nearly) a list of things common in the rest of America, such as moccasins, chipped stonework or shields (as well as agriculture except for tobacco, and pottery which is here replaced by basketry, as in California, and by excellent wooden containers). It has its own peculiarities, including woven hats with spindle tops, and cloth made from shredded cedar bark. This all suggests an isolated development, even more than in California, in this naturally rich region, and also points to some recent contact with the Old World, conceivably through the Aleutian Islands. At the same time excavation has not shown the culture to be a very old one.

The Northwest Coast people were somewhat peculiar in their social life as well. We find a strong class system and an almost feudal organization, with titled families who showed their "crests" on totem poles ("totem" is not a good name for them). The heads of such families were nobles, rather than chiefs, and headed their own families as well as attendant families of commoners and slaves. And the workings of this social system took place through the famous potlatch (particularly in the center of the area), which should put you in mind of the far Pacific. A potlatch is a ceremonial gift-giving, held to celebrate any event of social importance (among the socially important). Like the taking of a head in Southeast Asia, a potlatch served to recognize and validate such

as event, and not leave it, let us say, in the status of a common law marriage.

A man held a feast and gave away blankets at the birth of a child, at the naming of a child, on assuming a title, on taking a new name, or at a funeral. A title would lapse if no potlatch were held for it. And the gift had a sting, because in many cases it had to be returned with interest. Boys when still young might get a pile of blankets at a low rate of interest (say a hundred per cent) and would be allowed to lend them out for a short term at a higher rate, and thus start building capital. Wives were "bought" by a potlatch for the father-in-law, who repaid the payment, to keep your wife you had to keep your father-in-law in your debt. No books were needed, for the potlatch, like the kula, was the great interest in people's lives, and everyone was on the watch to see that the accounts were settled.

The climax of the whole system was potlatching between nobles. If, in the Melanesian kula, giving gave glamor, it was done with good will, in friendship between two men. In the potlatch a noble backed by his retainers gave to a rival in the hope that the rival could not meet the challenge and would go down in dreaded disgrace. The feasts were nothing less than battles with gifts, ending in a gulf between pride and shame such as we can scarcely imagine. Piles of blankets were given, and furs. Much more valuable were coppers, T-shaped and decorated slabs of the beaten raw metal, which had names and great traditional value, like the kula necklaces and armlets.

These might be given as gifts; or they might be disdainfully destroyed or cast into the water before the eyes of the rival noble, to see how he would respond. He might answer by burning a canoe or killing slaves, or with coppers of his own. If the response again were the burning of more canoes, and of oil, and even of the house itself, what matter? The man under attack and his group should try not to be impressed with this small blaze, even as it singed their robes. Such an affray went down in song and tale, to the everlasting glory of the winner, while the loser might be forced into suicide.

So here is a society without domesticated food but having nonetheless a class structure as well as a clan structure, and with a complex general institution in the potlatch which was something like the lobola or the kula, putting family effort and wealth to the service of the prestige of the family through its head. In religion the shaman was the dominant figure, but secret societies were important, presided over by totemlike animal spirits, with a novice being taken in after a period of fasting in solitude in the forest, during which he supposedly visited the spirit home. A dramatic dance was held to lure him back, with masked figures to represent his kind of animal spirit, something which may also be represented on totem poles as well as the crests of the nobility. It was in the masks for these ceremonies that the Northwest Coast Indians best developed the force and boldness of their art.

The admirable Eskimos

The Eskimos make a second great "Mesolithic" hunting culture. Speaking a single language, they reach all the way from the south coast of Alaska around the American Arctic to Greenland and Labrador. Small groups of them live on the Siberian shore as well and so, with the near-Eskimo Aleuts of the Aleutian chain, they now occupy the region through which the Indians came from Asia, and have occupied it for some time. They are not settled like the Pacific coast Indians; they are strictly hunters and must move seasonally, sometimes in very small groups. There have been, it is true, a few heavily settled places like the ancient town of Ipiutak near Point Hope, Alaska, where the game was plentiful; here there were six hundred houses.

They may hunt caribou in the summer, and deer and ducks and geese, while fox, wolf and polar bear are always present. But their true dependence is on the mammals of the sea: whale, walrus and above all seal. And the true stamp of their culture is that it lets them survive through the winter. "Mesolithic" though it is, it stands head and shoulders above that of any other hunter-gather-

ers in the ingenuity and intelligence it exhibits and in the way it has adapted man to a most forbidding environment through a wealth of inventions. The Eskimos have faced, in addition to all the cold, the handicap of having almost no wood to use except driftwood.

They live, in different places, in earth-covered houses of stone or whalebone, or wood where possible, and use tents in summer. And no school child breathes who does not know about the igloo, the snow house of the central Arctic. This is really a better shelter than it might seem to be. The entrance is protected by a special corridor to keep the wind out, and the house itself may be lined with skin, hung from thongs through the snow wall, so that it is practically a tent within a shell, and well insulated. The air within may be close but not very cold. They have no fires which might melt the whole thing down, for they have no wood anyhow, and they get what they need for light, warmth and cooking by burning oil with a moss wick in a soapstone dish. One hazard is the humidity: if you wear your outdoor clothes indoors they are apt to take up so much moisture from the humid air as to freeze stiff when you go out again.

Clothes are of skin and fur, of course, and for cold weather the Eskimos wear two suits, the inside one with the fur side inside and the outside one with the fur side outside. There is nothing primitive about these garments. The Eskimos are tailors and fitters extraordinary, and decorate their clothes with inset panels of furs of varying colors. They can also sew a watertight seam, and do so in making seal-gut waterproofs, like a seaman's oilskins, for rain and for protection against shipping water in a kayak. For the usual caribou or sealskin outfit they wear long boots, and the parka (a Paleolithic inheritance?) with a hood, detachable or not, for covering the head or carrying the baby, as you wish. Only the face goes without good protection, and even here they use wooden slit goggles against snow blindness.

They hunt with bows and spear throwers, and catch birds with a thrown bolas (see Chapter 6). But their vital weapon is their harpoon, which is made of several parts. The main shaft is of

precious driftwood, with a joint and then a foreshaft of bone; and on the end of this is the harpoon head itself. Thongs hold the whole thing rigid until it is thrust into an animal. Then the joint in the shaft loosens, which keeps the wooden shaft from breaking as the animal shakes it, and also frees the long rawhide line which is attached to the harpoon head. The point itself thus comes off: it has a barb on one side only, so that it turns crosswise in the flesh of the prey when the line is taut, and there is the animal securely hooked.

In winter the hunter goes out on the ice, searching with his dog for the holes in the ice (usually covered with a blanket of snow) through which a seal must come every so often to breathe. If he finds one, he knows a seal must be near beneath the ice, for the hole would soon freeze if the seal did not constantly use it. All he need do is wait, harpoon the poor seal, and pull it in when it has tired itself out trying to swim free. In summer the harpooning of seal and walrus has to be done from a kayak. After being harpooned, the prey is prevented from escaping, and quickly exhausted, by floats of inflated sealskins and by tambourine-like drags, attached to the harpoon line.

The kayak itself is a beautiful piece of construction, with a light frame of wood and bone, covered with a watertight skin except for a hole the size of the paddler's waist, so that an Eskimo can overturn and right himself in the water with his paddle without filling up. This is no stunt; it is simple lifesaving practice and he must be able to do it. The Eskimo sledge, the dog harness and tackle, and the driving of dogs are all further examples of Eskimo skill and ingenuity, especially in making out with little choice of material. Add to this their traps, some of which are no less than fiendish in their simplicity. Let us note only the wolf coil, a strip of whalebone sharpened at both ends, coiled up and implanted in a piece of meat, which is allowed to freeze, and then left out. The greedy wolf comes by and swallows it down without chewing and—serve him right—the meat softens, the whalebone uncoils and he is stabbed to death from within.

The Eskimos have their troubles, and their shamans, but they

are impressively self-reliant and adjusted. Hunters though they may be, they certainly could not carry their possessions on their heads like the Bushmen, and in fact have advanced about as far in culture as would be possible in their environment. The only progressive invention they might make now would be to go south and their very way of life would make them reject the idea.

Eskimo origins are still unknown. However, the Eskimos are not really old in America. The culture is traceable back in time, in its same general form though with changes in emphasis, for about two thousand years, to the beginning of the Christian Era, but no more. And in its early days it already had an art style which seems to reflect classical Chinese influence, and to demand trade iron from China for the cutting of ivory (recent Eskimos have used native copper and meteoric iron, both worked raw). Alone among the Americans, the facial type of the Eskimos belongs with the highly modified, flat-faced Mongoloid peoples of Siberia, and this argues powerfully that the Eskimos are a recent immigration quite distinct from those that had come before, even though they may have culturally influenced some of the Indians, particularly on the Northwest Coast.

Now some of the features of Eskimo culture also occur along the north shore of Siberia, and the present best explanation of the whole Eskimo phenomenon is that it crystallized, as a successful shore culture, from late Mesolithic elements on the arctic coast of eastern Asia, where it was isolated from the advancing cultures of central Asia and the Far East; and that it blossomed in the Bering Sea region and flourished in America.

The woodlands, heart of North American culture

So no great antiquity can be assigned to the life recently lived by the Eskimos or by the Indians of the Pacific Northwest. The Californian pattern, however, may be very old; ancient remains are abundant, probably of a seed-gathering culture like the South-

western Cochise. Whatever the history of these western and northern peoples of the continent, a third sort of Mesolithic culture, which I have mentioned already, made its appearance in much of the interior woodlands of North America at a still early date, following the hunters of the big game, and certainly before



Suggested Mesolithic influences from Asia on North America, and later counterinfluences from native American Neolithic culture in the south

500 B.C. It owed something to Asia—nobody yet knows how much—and perhaps to the same general northern forest culture which later produced the Eskimos, for it has yielded a few Eskimo-like traits in its remains. And it must have been the eventual forerunner of much of the recent Indian life of our own country and especially of Canada.

The people of this time or soon after made polished stone tools of various kinds: adzes and gouges for working wood, fancy "bunner stones" and other strange shapes ("plummets" and "bayonets"), some of them used as balancing weights for the spear thrower. They had ground stone axes with grooves around the

maddle for hats, and a variety of stone knives, scrapers etc., also hooks, needles and awls of bone. They worked skin, corns and seeds such as ragweed, pigweed and sunflower, on grinding stones. And they were users of shore food particularly, for they have left great shell heaps on the coasts and rivers all the way down to Florida and Louisiana. Sometime before 2000 B.C. such Indians built an astonishing system of weirs for trapping fish in the tidewater of the Charles River; the remains still exist deep in the silt under the Back Bay section of Boston, in the form of several banks containing some 65,000 stakes in a space of two acres.

This general culture, known in its later phases as the Woodland, was added to as time went on, and a major addition was pottery. This was first poor and then mediocre, with pots commonly having a conical or lemon-ended base rather than a flattish one, and a generally vertical shape; and having a coarse surface decoration made usually by the impression of a cord. From the nature of this pottery, which is different from that of the central area of the Americas, and from its time and distribution, the conclusion is that it was introduced before 3000 B.C. from Asia, where there was much pottery of a similar tradition of textured marking in many places, and especially in eastern Siberia. Here then, as in some other late Mesolithic settlements in the world, we have pottery in the hands of people innocent of agriculture, but people who would have found it useful nonetheless in the cooking of wild seeds.

Introductions into the Woodland culture of the east continued, but now the pattern takes a major shift, for the introductions come mainly from the south, not from Asia or from the people themselves. The first was agriculture, in the growing of gourds, squash and corn, heralding the arrival of a Neolithic phase from its native American origin in Central and South America. This appeared sometime before 1000 B.C. Another new thing, coming about this time, and possibly with the agriculture (though perhaps from Asia), was the making of earth mounds for burials.

Interest in the dead was old in this Woodland culture. Goods had long been buried with the corpse, and there was a strange love of including red ochre, either along with the other materials or sprinkled over the whole contents of the grave.

But now, whether as an idea introduced from the outside or as one arising locally in the eastern United States, the dead began to get very special treatment, having the bones stripped of flesh and buried alone, or being cremated, and being buried in any case under a mound. Here we have the once mysterious Mound Builders, supposed by some of the romancers to have been here "before the Indians." Simple conical mounds were the early form,



Pot of the Woodland type, left, coarse-surfaced, compared with pot of the Mississippi type, smooth-surfaced and painted (see next chapter)

leading later to various kinds of earthworks, such as the effigy mounds of Wisconsin, having outlines like large animal crackers, with their bundle burials.

The cult had its great florescence in the Hopewell and Adena cultures of the Middle West, and especially of the Ohio Valley, which constitute such an outburst of energy and artistic ability that it was long difficult to believe that they rose out of the general Woodland pattern. They made rich and artistic grave goods, using copper, silver, mica, obsidian and river pearls, and carving

some stone statuettes and ornamental tobacco pipes of the highest artistic merit. And the mounds themselves are no less impressive in size and nature. The Seip mound, not the largest, contained some 20,000 wagonloads of earth, brought by men using hand tools. And the mound floors were evidently the scene of special rites, remains of wooden structures and burning pits for cremation being quite common. Burials were of every sort: plain, cremated or secondary (the clean bones alone). Some were in log crypts, and some were very strange: the Kiefer mound had twelve bodies laid out like swimmers making a stand, and three of these had their heads between their legs.

The riches (great wealth for such a culture); the work of building, the wide spread of the culture itself, and the trade necessary to bring river pearls, gulf shells, Great Lakes copper and Rocky Mountain obsidian together, all bespeak a period of tranquillity and stable political organization in the eastern United States. This disappeared, and the area had a temporary subsidence.

In the Great Plains, where simple agricultural villages succeeded Hopewell influence, some of the tribes found buffalo hunting and a seminomadic life more prosperous than crude farming, and so took a partial step into the past. When they got horses and the art of riding from the Spaniards, the hunters became mounted and became the rulers of the Plains, living on the buffalo and casting agriculture aside, assuming some of the warlikeness of the nomadic Bedouins or of the central Asiatics, and becoming a new chapter in our own history.

But in the woodlands to the east a kind of restoration was taking place. More and more of a new kind of culture was pressing northward from the south, mixing with or replacing the older patterns up to the region of the Great Lakes especially. It was flowing out of the tropical regions where progress native to the Americas had been taking place, and its origin and spread are a different story from the one we have been pursuing.

18 *The rise of American Indian civilization*

Far less is known of the antiquity of man in South America than in our own country. But it is clear that the hunters came there in the course of the peopling of the Americas generally, and that they explored the possibilities. In southernmost Chile, the Palli Aike cave shows a long series of occupations by hunters alone, from the earliest ones about nine thousand years ago down to the Onas of today. And in certain other southern parts and in south central Brazil the hunters remained nomadic and primitive, without benefit of Mesolithic suggestions from Asia or of the natural bounty of California and the Pacific Northwest.

But elsewhere examination of the possibilities brought its reward. For plants began to be domesticated, in the American version of the Neolithic discovery, and before the Spanish came something like a hundred different kinds of food were being grown. If the Europeans have been generously diffusing their crops to the rest of the world lately, think what they in turn got by diffusion from the Indians: corn, potatoes, sweet potatoes, beans, tomatoes, tobacco, chocolate, vanilla, peanuts, pineapples and rubber. Never mind things for the gourmet, like avocados, limes, Jerusalem artichokes, cassava, chiles and chewing gum, or a number of drugs including coca, ipecac, curare and cascara sagrada also is American, but the Indians were ignorant of it, (they had no use for it until we diffused malaria to them). These are only the things that have become important to us, for they had a host of others which we have not taken up.

A long list shows how many were the kinds of plants avail-

able for domestication, particularly in South America, and it also shows that the idea of domestication must have been a pervasive one over a long period. For some of the types, notably corn, were not simply taken and planted, but underwent a long process of improvement toward the things we have today. A great deal of scientific study has gone into the background of these various plants, but it is not yet known where the first, or the main, center of domestication was.

The great foods, corn and potatoes, as well as the majority of the remainder, are believed to be South American originally, though there is a possibility that corn is Central American. It is certainly not likely, in fact, that any given place looms as a sort of laboratory where one species after another was added to the menu. On the contrary, even if one area had priority, various other places must have served as centers of other discoveries and transmissions. It is perfectly possible that domestication itself was originally achieved more than once, in view of the many plants and their wide distribution, and it may even be that some kinds, such as tomatoes and squash, were themselves domesticated in both Central and South America.

Finally, it has been shown with varying force that at least cotton, gourds, sweet potatoes and coconuts were being grown both in the Americas and in different localities in the Old World (anywhere from Polynesia to India), before Columbus—i.e., they had traveled from one hemisphere to another in earlier times. This is a most interesting business, and a very controversial one. But it does not argue with any strength that the invention of domestication itself was brought to the Indians from outside, considering the solidity and the native look of the whole thing, and the fact that the plants in question, if they crossed the Pacific, most likely went from America in the direction of Asia, not vice versa. But let us leave this discussion and note only that the Indians performed a great series of botanical feats, whatever the details may later turn out to be.

The American Neolithic takes shape

The time of these early events is still vague and confusing. Some simple farmers began accumulating a large mound of rubbish at Huaca Prieta, on the coast of Peru, not later than 2500 B.C. They ate gourds, squash, beans and cattail roots, and grew cotton. They were evidently already used to settled farming; they fished, but the rubbish contains no land animal bones and no hunting weapons. They had a little weaving, but they also used bark cloth.

But here are a pair of surprises: there was no pottery hereabouts until 1250 B.C. and no corn until even later. However, this coastal region was surely not a center of origin of things, only some kind of a colony, and it may have been isolated from early corn-growing peoples by the highlands, where corn will not grow above a certain altitude. And corn had reached New York by 1000 B.C., and New Mexico by about 2000 B.C.; here, in Bat Cave, the earliest form of a long series consisted of tiny ears (the size of your little finger) having kernels in individual husks rather than a single husk for the whole ear. Since corn almost certainly came to New Mexico through Mexico, it must actually go back something like a thousand years more in its southern homeland.

Evidently there is a good deal to learn about these matters. It does seem likely that domestication was in full flower somewhere near or after 3000 B.C., and that an array of different crops was available to choose from and was being diffused hither and yon, leading to the eventual dominance of three foods in three places: potato in the Andes, manioc in the Amazon forest, and corn in Mexico and North America. As to pottery, could it have appeared under the stimulus of the North American Woodland pottery from Asia? Certainly the latter arrived in America early, but the pottery which came to be associated with the American Neolithic of Central and South America is different from Woodland pottery in almost every way.

At any rate, however tangled its roots, this native Neolithic

emerged, adding as animals the llama and the guinea pig (and the everlasting dog, apparently brought from Asia); rich in plants, the Americas were poor in domesticable animals. Then, following 1000 B.C., culture took important strides. Pottery was not only present; it was excellent, being represented, for example, in Peru by fine effigy jars, some with masks, some with vegetable shapes.



Example of Peruvian pottery. A black sculptured pot from one of the earlier periods (Chavín?), with cat mask motif

and some having the cat form which was a strikingly widespread art motif on Peru's north coast. Weaving was done on the loom, though it was not yet the craft it later became; and various arts, including working in gold, were present. And at Chavín some major religious buildings suggest cults attracting a large population, and a complicated social structure.

The people were now advanced and efficient farmers, rather than depending partly on fishing or hunting. And various kinds of evidence indicate that, in addition to the basic arts and a temple-and-priest religion, there were social classes, major public works,

organized war, human sacrifice, trophy-taking, and well-defined gods known over large areas. It seems likely that this kind of culture, of a well-advanced Neolithic type, had its home from the central Andean region up through Colombia and on into Mexico, and that it was a sort of common base in this whole territory from which the later civilizations developed.

*Farmers on the Amazon,
the Rio Grande and the Mississippi*

It also probably acted as a sort of spring out of which higher culture flowed into other areas, changing somewhat as it went. This arrived full-fledged on the north shore of South America and traveled up into the islands of the Caribbean, giving rise to a heavy population in these parts and adding them to the general area of early high culture in America. Elsewhere it became somewhat degraded. It continued along the Atlantic coast of South America, turned back and went up the Amazon, and so penetrated the equatorial jungle heart of the continent. Now I do not mean to sound as though the culture were on wheels, but only that it was diffused, and also certainly carried by tribal movements, adapting itself to each locality. It may not have traveled as a unit, but its many features are widespread; and in the Amazon basin it does seem to have arrived mainly by the long way around, instead of simply coming down the eastern side of the mountains.

In the forest it was much simplified. The Amazon Indians live in good-sized villages, traveling by canoe. They grow corn, yams and sweet potatoes among other things, but their great crop is the poison manioc (or cassava). This root has hydrocyanic acid in it, and you must remove it or it will remove you; grate the root and squeeze the juice out in a tubular basket which you stretch by using the limb of a tree and a lever, and you have cassava meal. Cultivation is by slash-and-burn, with the usual consequence of moving the village every now and then; and the men do a good deal of hunting with bows and blowguns, not because they must

but because it is the thing for a man to do. The Indians make pottery, and weave cloth and sleeping hammocks. But they wear more ornaments and paint than clothing, which is mostly taking in its absence. They tattoo and paint lavishly, and wear buttons or plugs in nose, lip or cheek; they bind their arms in tight basketry ligatures; and they are great users of feathers and iridescent beetle wings for personal decoration. The Jivaro use these wings in strands on their shrunken heads which are their particular expression of the general head trophy-taking. War is constant, and villages are isolated and fortified.

Socially and religiously, the complexity of the central area is missing. The Amazonians are known especially for the spartan initiation rites for boys, such as contests of whipping with long cane lashes, putting stinging ants inside a basketwork binding on the arm, where they cannot be scratched, and so on, things which are also used as magic for good health (to wake up a sluggish system). Noting this whole jungle culture to be a trimmed-down version of that of the great central area, you might compare it thus with Melanesia's relation to Southeast Asia. You might also note a sort of general resemblance in nature and a number of strong likenesses between the Amazon and Malaysia as well (e.g., head-taking, blowgun), without jumping to conclusions about contacts.

The basic central culture apparently had some fringe influences, rather than direct colonies, in North America. In our own Southwest, we have seen, the arrival of corn goes far back but this does not at once mark the beginning of a general farming population. That came later, about the beginning of the Christian Era, with farming of developed corn and a simple village life coming from Mexico.

Two parallel developments took place. One was the Hohokam of the Arizona desert, which continued to have influence from Mexico but finally went downhill into the Pima and Papago peoples of our day. The other was the Pueblo tradition, with the simple Basket Makers being transformed into the people of the stone and adobe hamlets of Pueblo times, which grew for a period

into the large one-house cities (probably for protection against the Navahos and Apaches, warlike hunters and raiders who came down from northwest Canada), and then spread farther out again in the self-contained towns, still of good size, of recent times. The Pueblos make, and always have made, fair to good pottery and textiles, and their religion is a well-developed priestly one. But their culture is a homespun thing compared to that which gave it birth, to say nothing of what was flourishing later on in Mexico.

Another set of influences, and less direct ones, came into the southeastern United States, perhaps both by Mexico and the Gulf Coast, and across the Caribbean itself, from South America. Corn, of course, arrived well back in the pre-Christian period, but an actual new cultural tradition formed itself in the Southeast, commonly called the Mississippi pattern, and it was this which thrust itself northward, into and through the old Woodland area. These people were builders of mounds, but used them to put temples on and not primarily for burial; and the mounds were rectangular and flat-topped rather than dome-shaped. In late times (as the Spaniards were arriving) the mounds became very large indeed, like the Cahokia mound in East St. Louis.

The Southerners made pottery of a great many different styles, less coarse than the Woodland and quite distinct from it, normally using shell as a tempering material, and running to broad, flat-bottomed shapes, with some external features like handles. Effigy forms were made as well. They went in far less for stonework than the native Woodland culture, but what they made was good. In other art they rivaled the strange Hopewell people in the making of bodily ornaments such as shell necklaces, gorgets, armlets, beaded leg bands and belts, using copper, pearls and broad shells. They were also able weavers and feather workers; and in late centuries their art was to a great extent employed in the service of some kind of ceremonial cult, probably of Mexican derivation. The remains, and carvings on shell, show men handsomely accoutered with insignia featuring animal-human motifs, a death's head, and a hand with an eye in the palm.

This was the culmination of the Mississippi culture. General



The rise and spread of higher culture in America, and its peaks of development

disruption and disease on the arrival of Europeans kept the latter from seeing much of it in action. Nevertheless, the French and Spanish were impressed with the relative prosperity of the towns along the southern seaboard, and with the elegance of their chiefs. The Gulf and the Mississippi Valley were the scenes of its best days, but in earlier or simpler forms this Mississippi pattern pushed up into Wisconsin (where the palisaded town at Aztalan was an outpost) and Ohio. Eastward the Iroquois were its historic

representatives, while the Algonquian-speaking tribes were the inheritors of the Woodland.

Civilization in the Andes

So much for "Neolithic" America. What happened in the central region in the last two thousand years? Briefly, agriculture was perfected, with irrigation and the filling out of the list of foods; and the population became heavier and heavier in the most favorable places. Knowledge, architecture and the arts strode forward, and these advances were largely shared throughout the central area. In spite of contacts and communication, and the knowledge shared, there long existed a marked degree of local variation in style and local political independence. Eventually, after the opening of our own Christian Era, like high peaks arising from the general plateau of advanced culture, there appeared the three civilizations of the Andes, the Maya region and the Valley of Mexico.

The Andeans, centering on the coast and highlands of Peru.



A portrait jar of later Peruvian period

had their great development in two departments: the craftsman arts and politics. It is hard in a short space to say anything which will convey the nature of their artistic achievements. Pottery early reached a high level and remained varied and lively. The north coast produced a striking naturalistic style, with pots taking animal, human and other forms, including human heads which look like actual portraits. The southern part used simpler shapes but with lavish color painting. Both kinds of ceramics depict much of the life of the people themselves, and pottery as a whole shows us the boundaries of different groups at different times, as well as the spreading influence and control of successive larger states.

Textiles need a book of their own, for the Andeans invented and used more different techniques of weaving than any other people on earth, having the basic weaves as well as a multitude of tricks which we do not take advantage of today because they can be done only on a hand loom. Much of their fanciest work was made for mummy coverings rather than for everyday clothes. Not having been exposed, like the Europeans, to the Siberian-Eskimo idea of tailoring by cutting and sewing, their clothing ran to rather squared-off shapes like the face cards in Alice in Wonderland (which it has also done elsewhere, as among the traditional dress of the Pueblos), a defect which they counteracted to some extent by shaping the piece of cloth *in the weave*. They made some extremely fine yarns; they started with cotton but went on to wool and maguey fiber. One wonders what they might have done with silk. Fortunately quantities of woven material have survived in graves because of the dry climate, and I can only repeat that they are as impressive as this description is short.

Finally, metalworking at the time of the Spanish Conquest had reached the point of using bronze for a number of everyday implements like chisels and points for digging sticks. Copper had already been used, and decorative work in gold and silver was old, and the Ecuadorians were even working platinum and making gold filigree.

The last major art, that of building, seems connected with social

developments. One important religious center, Chavin, had existed before the Christian Era. Then, following some very localized developments, the last centuries before 1000 A.D. apparently saw some larger unities or political communities, culminating in the general dominion of the Tiahuanaco culture sometime after that date. This is visible in a variety of traits of pottery style and textile design which were present all over the central Andean region, and it is named for the abandoned religious center of Tiahuanaco itself, high up near Lake Titicaca, and just over the Peruvian border into Bolivia. This city is extraordinary not only for its altitude but also for its size and apparent importance, and such features as the gateway carved from a single stone.

The indications are that it was one major ceremonial center in a cult which managed to command the worship (and the labor) of all the area for a while. But the Tiahuanaco influence, religious or otherwise, evaporated, giving way to various large or small strongly organized, well-defined states. These were building major cities, and the form of the cities (laid out in wards or barrios, with reservoirs, regular streets, cemeteries, etc.) indicates that city life was now a true feature of the culture, and that political arrangements were certainly complex. There was evidently a good deal of fighting, to establish authority and to defend it. Finally, not a century before Pizarro came, the Incas carried the whole trend to its logical conclusion. They came out of their particular region around the city of Cuzco and subjugated not only the central Andes but Ecuador and half of Chile as well.

The Inca people were actually rather inconspicuous among the states of previous times, though their own development must have been about like that of others. They had a record of twelve sun-descended rulers, but it was under the last four that the Inca Empire rose and fell. In 1445 they began, deliberately and with great determination, to bring under their sway by diplomacy and war all the states and tribes of the region. This they did, unifying a territory the size of the Atlantic States of the U.S.A. and holding it successfully until the Spanish, with horses, armor and superior ruthlessness, murdered the last ruler, Atahualpa, and so

destroyed the structure. It is a pity, and not only for Atahualpa, because the Incas had just taken certain potentialities of the Andean culture and applied them with a new energy, and it would be interesting to see what would have followed.

The Incas had no secret weapons, but only the old ones, though the use of bronze was fairly new. But they exercised no draft and had a well-drilled standing army officered from the noble class. When they went to war it was a true military operation and no raid: conquests were planned, sieges laid, roads were built and kept in condition, communications were maintained by runners, forts (like the astonishing mountain-top site of Machu Picchu) were built, especially where defense was necessary against unconquered forest barbarians. And if a subdued population gave trouble, they uprooted segments of it, transplanted them, and replaced them with well-domesticated people from elsewhere.

It was therefore not weapons which made the Inca conquest possible. It was such a thing as a perfected agriculture which giving a large surplus of food, had long before allowed the arts of peace to develop and now allowed the arts of war by enabling the feeding of an army (a fixed proportion of the food grown by farmers went to support of church and state); such a thing as the development of a class-ranked society and the idea of total political control by a ruling class; such a thing as advanced town building for forts and cities. In the end, it was the ability to take large quantities of human labor and dispose of it according to the plans of those in control.

This was probably the motive, conscious or unconscious, of the Inca conquest itself, to which they modified still other ideas of Andean culture. Slavery, for example, was a very old idea, but what the Incas were doing was not capturing slaves for the service of a few nobles or owners, but capturing whole communities of ordinary farmers and workers, simply to incorporate them into the economy; as going concerns. This can probably be defined simply as imperialism.

And they also invented true totalitarianism as well, though



An view of a portion of the ruins of Chanchan. The grouping of buildings into wards, within walls, in a highly formal arrangement, suggests a strongly organized political control

lived together in groups of ten under a foreman (this might correspond to a village or ward), grouped ten such groups into a "tribe," and so on up to the four great divisions of the empire. In so far as there were still remnants of an older joint family or possibly a clan organization of society, this later political or economic arrangement replaced it as the order of things (and it may have existed well before the Incas, judging by the plan of such an older city as Chanchan). And all life was stiffly regimented for commoners, who had to work on what they were sent to, and could neither make nor own any luxury materials for themselves, while the nobles were either relatives of the ruler or the surviving rulers of other conquered states.

Thus the entire empire could respond to the orders of one man. It was a system as efficient as it is horrifying, and it was undeniably successful. You have probably seen pictures of the massive masonry work of the Incas, of closely fitted large blocks of stone. One of its striking examples, the fort of Sacsahuaman, is reported to have been built by a force of 30,000 men, and it is also said that the rulers sometimes had difficulty keeping their supply of labor busy. Certainly the population was heavy, with Cuzco and its environs having 100,000 souls. Even so, the system had its weakness. It had lines running only up and down, and it was too ant-like, and so when the Spaniards seized the person of Atahualpa the empire as a whole was paralyzed. The fame of the Incas was one of the great episodes of human history, and it is our sad loss that we know too little about it. We must depend on the patient labors of the archaeologists, for the Andeans did not write, and they had only the simplest forms of keeping number records.

The Mayas: architects and astronomers

In these things they were mastered by the Mayas of Guatemala and Yucatan, the second pinnacle of American achievement. This is a little strange on the face of it. For the Peruvians could have made good use of such knowledge in commerce and in political administration. But the Mayas used their mathematics, astronomy and "writing" for religion. And their building art, supreme in the New World, served the same end.

Now you have seen how, in the Andes, religious centers occasionally had widespread importance (particularly Tiahuanaco), in the days before politics became the engine of control of the whole region. It was this side of culture which prevailed among the Mayas. Here was clearly a peaceful area during most of the centuries, made up of city-states presided over by one general religion and by priesthoods, not by rival secular rulers. This is not to say that they lacked warfare or human sacrifice, for they have

left us paintings of these things. And the states sometimes formed alliances for defense. But their cities are actually centers for temples and other religious structures, quite without fortification, and serving as the ceremonial hubs of suburbs and of districts of humble farming villages.

The Mayas occupied the core of Central America, and during the period of their civilization the center of gravity or of development shifted from the highlands of Guatemala in the south, northward through lowland Guatemala and finally up into Honduras, Yucatan and southern Mexico. Their stone cities first appear in the lowlands, the Peten, sometime after 300 A.D., reaching an imposing climax during the Dark Ages of Europe. Then they underwent some kind of disruption which is not yet understood, followed by a final phase preceding the arrival of the Spanish, after 1000 A.D., centering in Yucatan.

Chichen Itza is the city you always see in photographs, with its simple and pleasing Castillo on a pyramid, its Ball Court, its Observatory, and the Temple of the Warriors, surrounded by the once-roofed Court of a Thousand Columns. But Chichen is late, represents a mixture of influences, including Mexican, and was built apparently in hodgepodge fashion over a long time with little planning. Such an early city as Tikal, unfortunately deep in the jungle and inaccessible, is at least as interesting. It has a highly formal orientation of temples around a central acropolis, with a marked uniformity of style and an insistence on height of both pyramids and temples. Another city, Copan, is famous for its inscribed stelae (columns) and its stairway. And Palenque, in a region of hard stone, made much use of plaster and had a freer sculpture style, making it highly individual; most Maya buildings were of limestone, worked with stone tools.

The Mayas were architects where the Peruvians were merely contractors. The latter used some decoration by carving, or by arabesques in the mud surface of walls, but they were only making structures for certain purposes, however well. On the contrary, the Mayas, like the Greeks, meant their buildings to be viewed as wholes, and knew the meaning of proportions, symmetry,

zones of decoration, light and shade, and so on. Typical temples (not the galleries called "nunneries") were on pyramids with lavish carving of panels into serpent masks. Buildings and pyramids were stone-faced, and probably mostly plastered and painted.

But the Mayas for all their artistry shared a general Andean lack of certain principles of building. Their stone walls were not structural (like the Incas') but only facing filled with rubble.



A temple at Tikal, restored. This is one of the earlier Maya cities, the largest. It is characterized by steep pyramids and temples with high decorative roof combs.

And walls were the weaker because the stonework was not properly bonded, or offset from tier to tier, like good brick-work. And worst, the Americans never discovered the meaning of the true self-supporting arch (though they made a few by accident), and relied on the false or corbeled overstepping (cantilevered) arch instead. This made their walls heavy, their rooms small and their structures weak; and the jungle's roots have seized the opportunity to wreak havoc in the dead cities.

Maya mathematics is if anything more impressive than the architecture. For one thing, they invented zero, or something for nothing, which is the key to the principle of "numeration by position," and so to the writing and handling of large numbers with ease. Even the Romans lacked this. You have doubtless ground your teeth at seeing Roman numerals for dates. Write 1948, for example: MDCCCCXLVIII! We have renounced this bestial system except on public buildings, for swank, and on licensing dates for motion pictures, to keep you from seeing how old they are, I suppose.

The mental process of unraveling this Roman date is as follows: "One thousand; one five-hundred; four hundreds; ten short of fifty, one five; three ones." In our own Arabic decimal system we simply let the *order* of the digits say how large they are, instead of spelling this out (i.e., writing "M" for "one thousand"). Thus we read 1948 mentally as "One thousand, nine hundreds, four tens, eight ones." And we recognize how far away a digit stands from the vital decimal point, though we do not always write the decimal point. The necessity of zero for this system is to hold a digit *away* from this unwritten decimal point whenever it is necessary. So we can write exactly 1000, "one thousand," the extra saying to us "no hundreds, no tens, no ones, decimal point."

Accordingly we write everything, very easily, in powers of ten. The Mayas used different basic amounts, running up to twenty, which would have been as clear-cut as our system except for the use of eighteen at one point. This was for their day count, and it went like this: 20kins (days) made 1 uinal; 18 uinals made 1 tun; 20tuns made 1 katun, and 20 katuns made a cycle (of 144,000).

days, about 400 years). So the date on Stela D at Copan, which reads "9.15.5.0.0—10 Ahau 8 Chen," means 9 cycles, 15 katuns 5 tuns, or a total of 1,405,800 days.

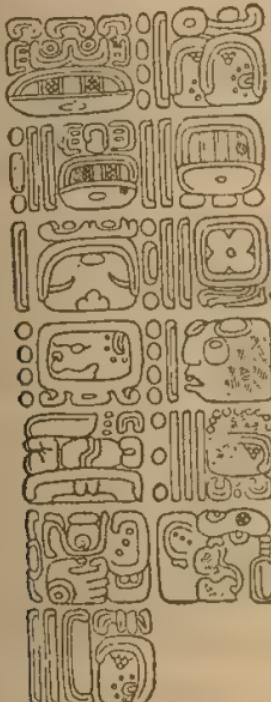
This is only part of the meaning of the inscription, and is purely a count of days, and periods of days, not of true years. They knew the length of the true solar year very accurately—more accurately than that followed by our own calendar up to two hundred years ago—but they did not use it in quite the same way. Instead they had a month and day count, something like our day names; and also another kind of cycle, of 13 numbers and 20 named days, both in sequence, so that the same day name did not have the same number for 260 days. Further, the year (of months) did not begin on the same named day except once in 52 years. Now look at the date I have just cited: this reads "the day 10 Ahau, the 8th day of (month) Chen." This combination likewise could only recur in 52 years, that is, any given pairing of a named day with a day of the year.

Now all days of the Maya calendar are dated from a day which was 1 Ahau 8 Cumhu, about a million and a half days in the past, whose long-count date was 0.0.0.0.0. The typical date simply states the number of days that have elapsed since that fixed day, and then gives the correct day name for the day arrived at—a great help in confirming the accuracy of inscriptions. In the case above, for example, the date 9.15.5.0.0., or 1,405,800 days, will indeed give a day 10 Ahau 8 Chen (although this would turn up every 15,980 days anyhow). The original starting date, "0.0.0.0.0—4 Ahau 8 Cumhu," would be about 3000 b.c., but that does not certify that the Mayas founded their calendar then. Instead, some thing about their system, once they established it, probably made them choose this mythical date as one when various cycles would all have worked out together. In fact all the clear dates of Maya remains fall in the eighth, ninth and tenth cycles.

These dates make up about a third of the inscriptions. The rest apparently have to do with other checks on dates, not yet fully made out. They do not, alas, contain the history of the Mayas, or directions to buried gold; they concern the same kind of matter,

whatever it may be, much of it apparently relating to the place of the moon in all this.

The day counts are perfectly clear. Why then do we not know the exact Christian date for each and every inscription? Because in the times of Chichen Itza, when the Spanish came, the Mayas



A Maya inscription from Naranjo (Stela 24). The glyphs are read from left to right and down. The first (top left) is the introducing glyph, signifying that what follows is an "Initial Series" or full day count (there are extra decorative elements in the numbers), along with standard glyphs for the periods involved, i.e., 9 baktuns, 12 katuns, 10 tuns, 5 uinals, 12 kins (or 9.12.10.5.12, a total day count of 1,386,112). The next two glyphs give the proper day name for this date, 4 Eb 9 Yax. The remainder of the inscription is supplementary material, not fully understood. In numbers, a bar is "5," a dot "1."

had become careless, and wrote only the smaller divisions of the count (like '97—is this 1897 or 1797?). And in their hot zeal to destroy this illustrious paganism the newcomers never ascertained which cycle, or part of that cycle (thought most likely to be

11.3.0.00), ~~the~~ ^{the} ~~best~~ ^{best} chronicle on the
burned trees (written on
paper)

How many years did it take
to remain a legend in
time of Mexico? The
movements of Venus, Mars,
and Saturn. It was the
superiority of the calendar
indicating the best time.

Aztec, atavistic and modern

The third region of highest culture is
Mexico, with the Aztecs. They were
once more the people of the sun, but
inventions. It was the sun that
it is the one American
traditions of a modern nation, Mexican.

It grew from the
Peru, and other regions, but the
formative cult was more advanced
today. It presented such
such works as the
Christ of the
traits (a calendar simpler than the Maya
The city of Tenochtitlan
The culture intended for the great
Mexico City, with
Moon, and the
many gods, but
containing the
freeze of the

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and a spout (---) a handle used
to draw water from the well
the mouth of which is shown in the drawing
the water is drawn by a bucket that
is suspended by a cord from a pulley



Open portion of well

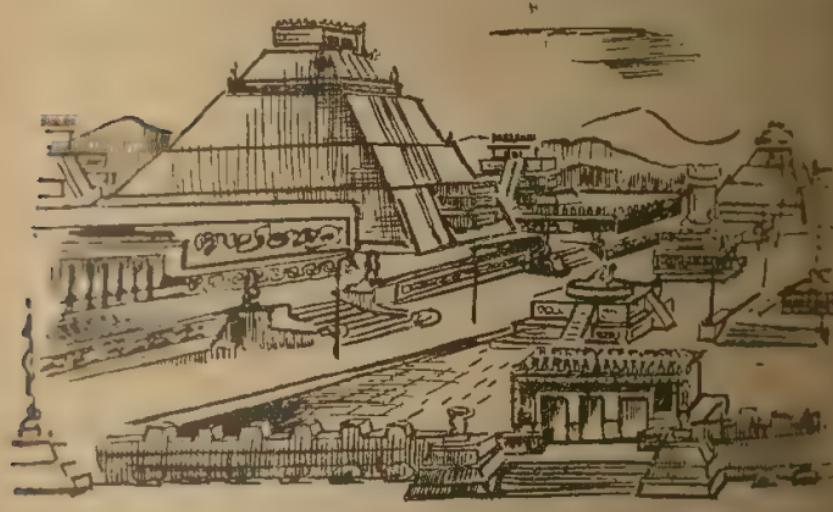
and a powerful one in which religious customs and superstitions Mexican origin invaded Maya life and customs to such extent that

the Spaniards were unable to either
convert the Indians to their religion
or to completely subdue them. The
Spaniards, under P. Cortez, invaded in 1521 but found
the Indians in such numbers and so well prepared

for defense that they were unable to settle. By
1540, however, the Indians had been captured
and converted to Christianity and the Spaniards had

Mexico). This at last they did, causing them to found Tenochtitlán (the center of modern Mexico City) on the island in the lake.

Histories preserved from other tribes tell it a little differently; the Tenocha—the Aztecs—arrived on the shore of the lake, in the region of modern Chapultepec about 1250, and suffered many defeats from rival peoples, particularly the Colhuas. They beat the latter on one occasion, however, and were given a chief's daughter by them in order to found a royal line of their own.



A view of the center of Mexico City (where the Cathedral now stands), giving an idea of its appearance in the time of Montezuma. Montezuma's palace is at the left. Beyond this is the great pyramid with the twin temples of Huitzilopochtli and Tlaloc, gods of war and rain respectively. In front of this is the round Gladiator's Stone. Beyond this is the round temple of Quetzalcoatl, and to its right a part of the great skull rack. After a painting by Ignacio Marquina.

But the Aztecs incautiously sacrificed her instead, and had to take refuge in the lake from Colhua fury, which they did in 1325. Now they prospered, and in two hundred years became the dominant city, through aggressive war and the making of alliances. They did not, like the Incas, incorporate other peoples into a single nation; they simply kept tribes under tribute by war and the threat of war, over much of Mexico, even though they were by no means in absolute control of powerful neighbor cities on the lake.

drove into this sea of suppression, hatred, treachery and fragile
alliances that Cortes and his tiny band waded in 1519, so that
the extraordinary Spaniard was able, in his campaign against the
Aztecs, to make allies out of many of the tribes he defeated.

He and his men were deeply impressed with the city of Mexico,
with the arts and crafts of the Aztecs, and with the luxury and
elegance of Montezuma's court and the deference with which he
was treated, even as they were appalled by the quantities of
human sacrifice, and of course by the heathen temples which dom-
inated the city from their pyramids in the Zocalo. The Spaniards
found a well-organized trade, with markets in all the main cities,
and roads maintained by the government. They found not only
certain goods (textiles, corn, cocoa beans) serving as currency,
but also other goods being brought in as constant tribute from
subjugated tribes, according to a fixed tribute roll kept in picture
writing. Such tribute included feathers, fancy garments, gold and
silver. Merchants were in fact a professional and privileged
class, who actually acted as intelligence agents for the govern-
ment, both as to what could be had in tribute and as to how a
given tribe might be attacked. And to add insult to injury, these
commissars were assured diplomatic immunity by the Aztecs,
who would punish any injury to them.

The government itself consisted of a full court of officials, and
there was an extensive law and system of justice. Life was not
as completely dictated as in the Inca Empire, but ideas were
strict nonetheless. Pulque could be drunk by none but old men,
and chewing gum was chewed only by little girls and women of
the street. So political life was well developed, even though there
remained vestiges of the old tribal structure of society. The mili-
tary organization was built on the old clans, which were still of
importance. The "emperor" himself was actually a war captain
chosen from the clan war chiefs, and he was still in process of
climbing rapidly into a powerful ruler in his own right when the
Spaniards arrived.

This is the last of the high cultures which were just burgeoning
in America when the Europeans ended their development. Did

these people or their forerunners in Central and South America have contacts with the Old World, especially across the Pacific, before Columbus? It is a perennial question. There are many strange parallels in simple culture; the blowgun is only one example, two early plants, gourds and cotton, occur together on the west coast of South America soon after 3000 B.C., and there are two of the small group of plants which seem to have been grown long ago in Asia as well as in America. But the Polynesian islands—the necessary steppingstones—give no evidence of having seen human beings before the Christian Era (and Hawaii was probably not reached before 800 A.D.). Some of the suggested connections are simply fantastic. Some are baffling but like the series of likenesses in temple art motifs between the Hindus and the Mexican-Mayan area, must be looked at seriously.

There are nevertheless certain considerations which are usually jumped over by those who prefer the romantic to the prosaic. First is the fact that the American sequences found in archaeology look like long, native, natural developments without signs of sudden intrusions from elsewhere bringing marked changes. Second is the fact that what has been invented once can be invented again in another place. Third, do primitive adventurers dare to take voyages of the utmost danger in order to carry their own culture to others? And do those others behave with proper courtesy when the boatload arrives? (Accidental voyages seem to be less likely to have any effect, though perhaps are more likely to occur.) Finally, do most of those people who look at a map and imagine such voyages really consider what it means to cross thousands of miles of turbulent salt water in any kind of boat, let alone a still primitive one? The voyage of the Kon-Tiki is by no means the whole answer.

Such things may have happened. But what is their meaning to the Americas? The weight of evidence gathered by those who make it their business is this: the eastern Pacific Ocean was too great a barrier for man until the Polynesians penetrated it first; and the American Indians themselves built up the cities which made possible the Aztecs, the Mayas and the Incas.

19. *The cradles of civilization in Asia*

Digging in America is likely one day to give us a full record of culture rising from a hunting level. Already this much clear domestication of plants by the Indians allowed steady progress from simple beginnings to a highly efficient food production using irrigation. And the ability to raise all the food with something like half the labor at last permitted an actual new type of society, that of civilization.

Now you might get various definitions of civilization, but let me here use simply "having cities," with all it implies. It implies less dependence from the surrounding country, on which a city can live. It implies transport, to bring the food in, and also markets, and so trade generally, and so trade goods, and so full craftsmen, the makers of anything except food. It implies new social inventions, with a kind of formal government to rule not only the city but also the country which pertains to the city; and these new institutions bring the erosion of the older kind of local organization, where kinship is strong and politics weak. Yet it usually means an expanded religion, with major gods beyond tribal instead of tribal, a thing which was in the process of happening among the Aztecs.

In other words, emerging civilization means that the country has given it off a head. Civilization does not signify cities alone, for the farm villages remaining "Neolithic," no matter how primitive they may be. Rather, it means cities as the focus of the country, and includes the villages, which are no longer isolated and self-sufficient, like those of the Melanesians or the

Indonesians in which each man is a farmer, whatever else he may do in his spare time. It means not tribes but states.

Dahomey, in West Africa, produced a simple civilization, as we saw. The American Indians of at least three regions reached a higher point. The Indians suffered certain handicaps, and had failed to make certain inventions, which shows their achievement all the more remarkable. In the first place, their best excuse for a beast of burden was the llama, a humpless, weak-backed, cranky, undersized camel, which is better than nothing, but which in any case was known only in South America. Perhaps this was a reason why the Indians did not use wheels for carts, another handicap in transport. They were forced to depend on human carrying, and they made special efforts to cope with their limitations: they established roads, had systems of runners for communication, and trained the armies to live off the land as much as possible. They had also only just begun to use metals in the proper sense, and the writing of the Mayas and the Mexicans was still rudimentary.

Nevertheless, the great social change had been made, and the Inca Empire, writing or no writing, was a fact. The same change was made in the Old World, and here, with important technical advantages which the Indians did not have, and with no powerful outsiders to strangle its development in mid-career, civilization and urban life carried through to make the connection between the Neolithic of 6000 B.C. and the life we live today.

The scene of this was the same as the old Neolithic center of Southwest Asia, the Middle East. The location is perhaps not even as precise as in the New World but, as in the New World, there seems to have been a general base of high Neolithic culture which flowered into civilization in certain spots, in this case the river valleys of Mesopotamia (Iraq), Egypt and India.

The basis of the Bronze Age

People are known to have been living, in the Neolithic, on the fringes of the Tigris-Euphrates and Nile valleys. They began

settling the actual valley bottoms at a time when these were swampy, overgrown, difficult to work, but nevertheless well watered and supremely productive for farming, especially by irrigation. In the "Copper Age," a sort of late, improved Neolithic using some copper tools, we see settlers arriving in the floor of the Tigris-Euphrates Valley in Mesopotamia. More important, we see, between 4000 and 3000 B.C., some inventions of great importance being put to use, and in fact forming the base for the new society.

This Near Eastern civilization was in full flower by about 3000 B.C., to take a round date which will serve as a turning point. We can also call this the opening of the Bronze Age. This is an old term originally attaching to the use of metal, but one which is now employed for the civilization which had been hatching in the Copper Age, just as we can use Neolithic, meaning New Stone, to better purpose as the name for food-growing village life. From 3000 B.C. on, the Old World had passed the high-water mark reached by the New, and civilization was being established from Egypt to India. Let us see what had been happening just before.

The floor of the valley in Mesopotamia, at the head of the Persian Gulf, had only recently risen above sea level when the first people came down from the Persian highlands, with the culture known as the Ubaid, and began draining the swamps and founding towns. Cities rose, their mud walls washed down and were repaired, and mounds grew higher, as Babylonia was populated by the Sumerians in the south and the Akkadians in the north.

Before long the first great invention appeared: the use of beasts for power, to replace human muscles alone. It was applied in two main ways, for plowing and for transport. Neolithic agriculture is done with a digging stick or a hoe, in America, Africa, Melanesia or Neolithic Europe. If you can get an ox to draw a big hoe, you can not only cultivate far more ground in the same time, you can cultivate it deeper and more effectively, and so enormously increase the food one worker can produce.

And if you can get an ox to draw a cart, you can carry all this extra food from farm to city, and otherwise take advantage of easy



The great centers of early civilization in the Old World, and some of the cities (including the Neolithic sites of Jarmo and the Faiyum).

transport, which was made possible by the discovery of the wheel. Oxen were in fact first used to drag dry-land sledges before wheels were invented, and continued to do so later for ceremonial purposes such as royal funerals. But carts and war chariots, drawn by oxen or by donkeys (horses were not used yet and there was no riding), had both appeared before 3000 B.C. The wheel was promptly employed to speed up pottery making, by turning the wheel it was shaped, but this was hardly a world-shaking innovation. One other use of non-human power was made: sailing ships, which were certainly present in the Mediterranean and the Black Sea before 3000 B.C.

A second great advance lay in metalworking. As in America the first use of metal was doubtless cold-worked copper (as found in predynastic Egyptian graves). For the earliest Mesopotamians copper was scarce, but they soon began casting it in molds by melting it. Later on they were using the lost-wax method of casting, by making the desired object in wax, enclosing it in clay, and baking it, which hardens the clay and melts out the wax, so

time, leaving a hollow mold for the metal, to be broken later the molten metal has been poured in. Also, still before they had come into possession of the knowledge that adding ten to fifteen per cent of tin to the copper makes bronze, an alloy which is not only easier to cast than copper (which is apt to develop oxygen bubbles in a hollow mold) but tougher when it is finished. That is why bronze, rather than copper alone, became the industrial metal of a whole period of man's history.

Like pottery, this is a fairly complicated craft. It means not only knowing where the ores can be found, and how to smelt them, but also having some method, like bellows, to get a heat almost 1200° centigrade, so as to cast the metal, and having various molds and tools for working it. And the discovery had some complicated effects. Now perhaps metal for tools, and the plow and the wheel, are not all necessary for an emergent civilization; for the Mexicans managed without them. But here in the Near East the plow and wheel opened the paths of trade, and metal enforced trade. There was no raw metal at all in the mud of the valley and so it had to come from outside, just as had stone in the earliest period. At the same time metal had taken on the greatest importance. It makes much more deadly and dependable weapons than stone: a stone knife might break in a fight, but metal is more rugged, can take a sharper edge, and can be resharpened or, if need be, recast. And it can be made into new shapes, such as a sword or body armor, not possible in stone. It is true that the Aztecs had a fearsome non-metallic sword of their own, a cricket bat edged with obsidian blades, but the advantage that Cortez' armored men had can be imagined. The same advantage can be seen in the hands of bronze-armed men facing stone weapons which were not even as good as those of the Aztecs.

Thus in contrast to Neolithic people, the pre-Bronze and Bronze Age Mesopotamians became absolutely dependent on trade to bring them copper and above all tin, ores which occur in only a few parts of the world. Now history makes it clear that such a people will use force if necessary to maintain a vital trade. The Mesopotamians did exactly that, and you may surmise what this

may have meant in the expanding city society. Metal was not only important, it was expensive, and so it was primarily held in the hands of the ruling classes for military ends, and not put to everyday purposes, which increased the effect of class distinctions.

Sumer and Babylon, temples and empires

Making use of these things, the early Mesopotamian cities grew up, among them Kish, Ur and Erech. Building changed from wattle and daub to mud brick, and the use of the true arch appears in some early tombs at Ur. Before long temples became conspicuous parts of the city. About half-way through the formative period, Erech had a temple measuring 100 by 245 feet. This and other cities also had ziggurats (we know the ziggurat of Babylon as the Tower of Babel). They were pyramids or mounds with setbacks, like boxes set one on the other, with a small god-house on the top, which had a stair leading right through the roof, so that the city's god could step down out of a cloud if he so desired. The temples, still early in time, began to show a marked richness, in precious objects and gold, and in ornamentation with imported woods and glazed bricks.

And this reflects the fact that they had become the focus of society. The gods ruled the people, through the priests, and the gods owned property as well. For the temples were a sort of corporation, which owned and rented out much of the land, loaned seed to farmers, and collected taxes, acting generally as the state. So the priesthood and the gods were the nerve center around which city life formed. Thus Sumer recalls the Mayas. Temples not only administered their own properties profitably but also produced luxury and market goods, having a staff to farm the temple land, tend its flocks, and to weave cloth, brew beer and make bread (one temple in Lagash had twenty-one bakers of its own).

Thus were the temples in religious, political and economic control. This was big business, and the needs of administration led

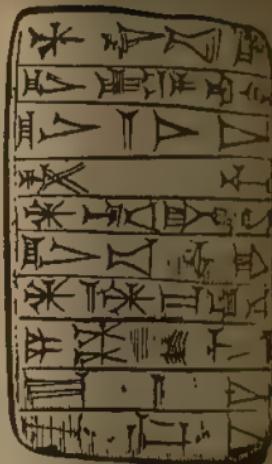
as they did only partially in the Americas, to a second set of inventions important to civilization: the arts of measurement, mathematics and writing. Measurement means, of course, proceeding from rough and ready means to the use of standards, and this the Sumerians did in a variety of departments. Their cubit (which means the forearm) had a length of about 19½ inches, and included 30 "fingers," which reveals where they got their first notions of measuring short distances. This may sound primitive; but they also divided the circle into 360 degrees of 60 minutes



The ziggurat of Ur, as it probably appeared

each, and we have never to this day departed from that usage. They had measures of area, and of weight, in which a mina (16½ ounces) contained 60 shekels. These various numbers suggest their system of numeration, which was sexagesimal, having signs for 1, 10, 60 and powers of 60. This system was a little clumsy to begin with, and in some cases used the Roman device of subtraction, as in "IV," meaning 5 less 1, or 4.

Their first accounts go back to something like 3300 B.C., dealing with all sorts of loans, rentals of land, estimates of labor supply and so on. Their mathematics was addressed to practical problems of the same kind, such as estimates of volume, but it advanced markedly in what it could handle as time went on, with tables and formulae. They arrived long afterwards at the use of fractions; in the beginning the Sumerians had avoided the problem by creating a large number of subdivisions of their standards of



Examples of Sumerian writing. Left, early pictographs. Right, cuneiform of the later Sumerian period. The more familiar cuneiform usually illustrated is Babylonian, and later still

weight and length. (The Mayas avoided fractions by using equations, which were suitable to their astronomical purposes; i.e., as though you said "he walks 2 yards in 3 steps," instead of saying that he walked two thirds of a yard at a step).

As to writing, this began as it did elsewhere by using pictures, and went on to have signs standing for given things (ideographs), becoming symbolic rather than pictorial. At first these were drawn on wet clay, and later pressed into the clay with a stick having a wedge-shaped end, so that the symbols were a combination of little wedges, as Chinese is a combination of strokes of a brush (for a while they also used round impressions, but gave it up). It is the wedge shape that gives this famous script its name: cuneiform. Now if there was one thing Mesopotamia had plenty of, it was mud and clay, and fortunately for us they used this in the form of biscuitlike tablets to write on, often baking them afterward. Therefore there are copious remains of their writing, including methods of teaching the script itself, with schoolboy work—very helpful—and even, in later times, collections of ancient writings preserved by their own museums. After all, by 1500 or 1000 B.C. the Mesopotamians could regard tablets of 3000 B.C. or earlier as something ancient, and quite comparable to our own antiquarian study of Rome.

But we are discussing the earliest writing. Still before 3000 B.C. the signs of the script had come to have sounds, instead of meanings only. That is to say, they were phonetic, and so could be used to stand for syllables in writing new words, just as you might write "before" by making a picture of a bee and using the numeral 4. One reason for this was that the Sumerian script began to be used to write Akkadian names. The language of Akkad was a Semitic one, but Sumerian was not (nobody knows what it actually was). And so signs which might have both sense and sound in Sumerian lost their specific sense when they were used to write the sounds of a foreign language. At any rate, by this time the script had grown to have some 2000 signs.

Now we stand at a major gateway to the present. By about 3000 B.C. the heavy work had been done. Full city life, resting on a plentiful agricultural base, and with a government capable of handling national affairs with the administrative tools of writing and mathematics, had reached fruition. And bronze tools, and chariots with donkeys, supplied the force both to defend the city and to rule it. This was the Bronze Age, and mankind was now equipped to go right on to life as we know it, and to form societies of unlimited size.

History began, if you will blink at some of the remaining uncertainty about exact dates. Mesopotamia, in any case, began to have a history. The cities started with temple governments: the god of a city was looked on as king, ruling through an *ishakku*, who was both high priest of the god and his executive governor. These governors eventually became royal in their own right, and not seldom made themselves divine as well. And so after 3000 B.C. the cities of Sumer and Akkad had actual dynasties. The early Royal Tombs of Ur, with their opulence (human sacrifices; goblets, bowls and helmets of gold; the ornaments and harp of Queen Shub-Ad, and the gold and lapis-lazuli ram and thicket), attest the power of the dynasts.

These early kings are hard to date, for the records give them reigns of impossible length. Not only that, but the royal houses at once invented still more improbable ancestors who were sup-

It is not late from before the flood (which is recorded as a great inundation) to be in the land just prior to the dynastic period, and which may well have been an actual inundation of this whole valley due to unusual rain, wind and high water in the Persian Gulf. The names of those heroic begetters in the fifth chapter of Genesis can start in comparison, for two versions of the list of the eightanted-luvian kings in Sumer add up to total 24100 and 14000 years respectively.

Whatever this may signify, succeeding personages were real enough. At first the little city-states fought among themselves, exerting occasional dominion one over the others. Then Sargon, of Sumeric Akkad to the north, ruling from his still undiscovered capital city, came down, overthrew the prevailing Sumerian tyrant, Lugalziggisi of Erech, and destroyed Erech's walls. He reduced the rest of Sumer and came to the shores of the Persian Gulf, where he washed his hands ceremonially in the waters of the sea, as the ruler of all Sumer and Akkad.

This little empire held together for a while, and under Naram-Sin extended its conquests westward as well. But then it disintegrated in the face of various attacks; and into the anarchy which ensued there poured down out of the eastern mountains the barbarians of Gutium, who seized power for more than a hundred years. Here we see the first signs of a process which repeated itself over and over in history: a civilized center rises, diffusing culture over a wider and wider area, and finally attracting the barbarians on the fringes, who come in with nothing to lose, use the weapons of the civilized to conquer them, and end by becoming part of the civilized realm themselves. It happened in Mexico with the Chichimeca; it probably happened in Peru; and it is certainly a major note in Chinese history.

Then several of the Sumerian cities recovered their own rule, and rebuilt temples and palaces. Lagash, Ur and Erech flourished again, with Ur briefly re-establishing an empire. But now a new barbarian threat arose from the Amorites, up the Euphrates to the northwest, and the Elamites from the eastern hills, who came down and overturned the last dynasty of Ur, setting up two others.

at the cities of Isin and Larsa, each claiming the rule of Sumer and Akkad. Finally, about 2000 B.C., another Amorite dynasty was founded at Babylon which, in a hundred years, at last firmly established the supremacy of the Babylonian Empire, running all the way to Nineveh in the north; and ancient Sumer and Akkad were no more. Even the Sumerian language went out of use and was lost. The famous ruler of this time was Hammurabi, who among other things brought together and codified the ancient laws of Sumer in the great Code which bears his name, and established them for the whole of his dominion. He also enlarged his territories, developed trade, made changes in religion (raising up Marduk, the god of Babylon) and planned the future of the city.

But this did not mean the lasting or serene rule of Mesopotamia by Babylon. After three hundred years invasions were renewed. First the Hittites from the west (speaking an early Indo-European language) pillaged the city, leaving a broken empire. Then an apparently similar people, the Kassites, took the dynasty and lasted for over five hundred years; they were probably responsible for the introduction of horses. During these centuries Assyria had grown up to the northwest, and beyond this the Hittite state, which in turn was neighbor to Egypt's territory in Palestine. Assyria came more and more often to hold sway over Babylon, though sometimes it was the other way. So empires grew in size. Just before 600 B.C. the Assyrian Empire was destroyed for good by its enemies, and Babylon had a brief resurgence, until the Medes and Persians at last conquered everything from Greece to India.

Iron Age improving inventions

This is a history full of the smoke of war, but one which saw some notable steps in the arts of peace. In the first place a new metal, iron, was discovered. A few objects of meteoric iron had been made much earlier, but these should be looked on as oddities and not as a real knowledge of iron. This knowledge was practically a brand-new invention, for the primitive smelting of iron

one time

I do

it

no it isn't in the book

one of them

is called apple pie



The Harappa people of western India

But we have now moved along into historic times. Let us retrace our steps and look at other sproutings of civilization in Asia. One was a great and unremembered empire all up and down the Indus Valley, in westernmost India. It lasted perhaps a thousand years, from 2500 B.C. or earlier, and then it was somehow banished from history for over thirty centuries, coming to the light of knowledge again hardly more than a generation ago.

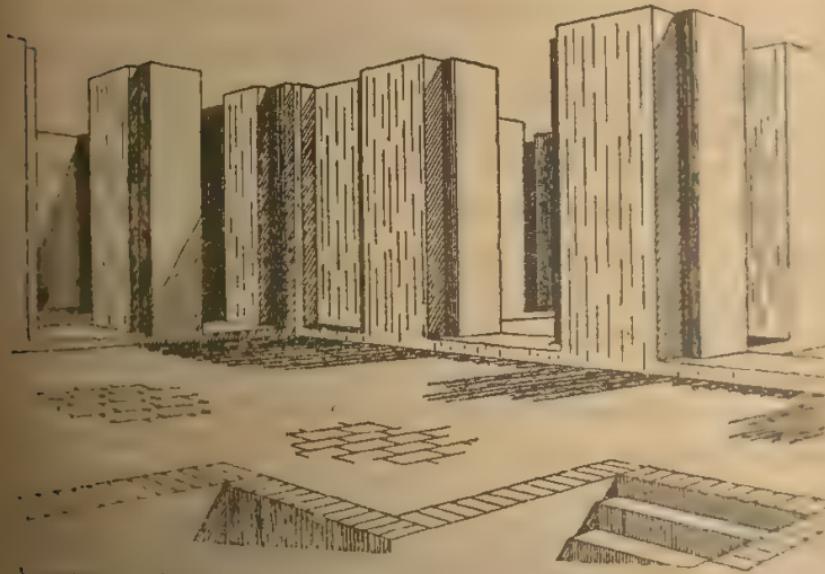
Before this empire there appeared, from the Indus westward into Baluchistan, copper- and bronze-using villages.¹ This was evidently at the time of the early towns and cities of Sumer, for there are some faint pottery style connections. (The region must have been far less arid than now, and it is likely that the limit of the monsoon rains has since shifted eastward, away from it.) When these village cultures had existed for some centuries, there sprung up a uniform civilization, evidently a single realm, including a number of towns along the Indus and dominated by two very similar cities, Harappa in the Punjab, in the north, and Mohenjodaro three hundred and fifty miles away in the south. This Harappa civilization must have had its roots among the simpler village people, but it must also have owed some major influence to another source, doubtless Mesopotamia or Persia. Just how it fused into the new civilization, and just why it spread and took root in so great an area, are mysteries. However, the deepest levels of Mohenjodaro have never been dug because, in spite of a drier climate, the subsoil water level has risen.

The people grew wheat, barley, cotton and dates, and had both humped and shorthorn cattle, buffalo, sheep, elephants, camels, pigs and chickens, a list which shows that their connections with the rest of India were good, and that the climate was indeed wetter (rhinos and tigers were also present). Like the Sumerians,

¹See Stuart Piggott, *Prehistoric India*, for an excellent account of this and what follows.

they worked bronze, as well as copper, lead, gold and silver. But where the Sumerians built their early cities of mud brick, with the streets laid out higgledy-piggledy and with later walls showing no reverence for older walls, the two Indus cities followed a strict street plan over the centuries and built with fired brick, which leaves the details of the bases of buildings in clear form for modern inspection. The better houses were of good size, with brick stairs to the second story, and timber-supported roofs, and with indoor baths emptying down ducts inside the walls to major drains running through or under the street itself. The outer walls were more or less unrelieved faces of brick, without windows, on narrow streets, indicating love of privacy. You might say the houses had no front doors but only back ones, since the entrances are unobtrusive. Much of the interior wall was apparently plastered.

Some houses of this kind were near-palaces, with smaller rooms which might have been for watchmen or servants. But another



A section of the Great Bath at Mohenjodaro as though restored, but open. Washing alcoves in the background, and the tank in the foreground, with steps leading down into it

kind of house, of which there were a great many, was a two-story affair built in rows and evidently for workmen. If there were temples, they have not been recognized or discovered (possibly one is still hidden under a modern Buddhist temple at Mandarao). The prominent buildings visible are granaries, and a large bathhouse with washing alcoves and a central bathing tank which may be the parent of the ritual bath tank of later Hindu temples.

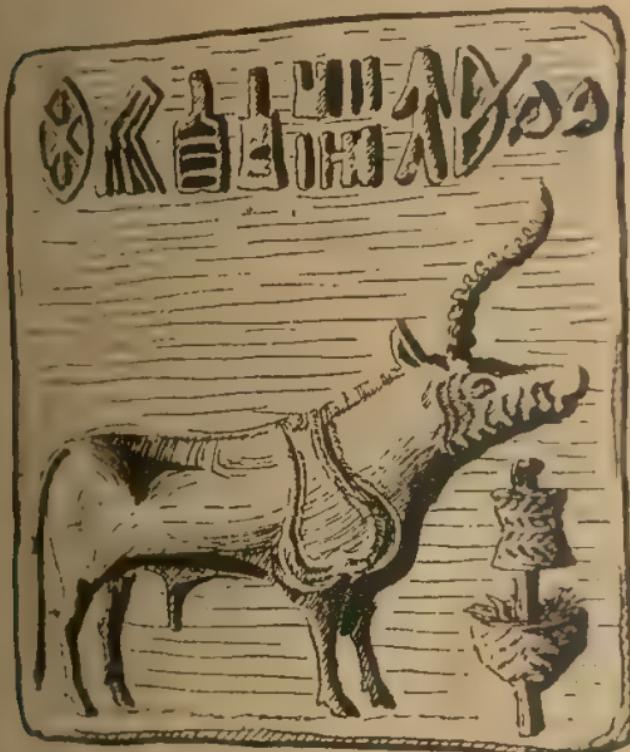
Oddly, there were no royal treasures or masses of luxury goods, but only hoards of personal jewelry, of gold and semiprecious stones. Small statuettes and many clay figurines found are probably religious, and these and seals may suggest both animal and tributes of gods and early representations of some of the Hindu gods themselves, like Shiva. But these things are not impressive or reminiscent of the treasures of the temples or royal tombs of Mesopotamia. There is only the impressiveness of the cities themselves.

The Sumerians, of course, speak to us through their tablets and inscriptions. The Harappa people also had a fully developed script, totally unlike the Sumerian but probably inspired by it in the first place, being certainly a good deal later in time. It must have written it on various substances, and it is well developed when it first appears, but they used it on clay only where they stamped jars with their stamping seals. These fragments of writing are all that have survived, and the script itself is still a mystery intact. So we learn nothing that we cannot see with our own eyes from the ruins.

The surprising thing about this whole culture is its uniformity and a certain dry and boring quality. There is no significant variation in styles or type, even in brick size, throughout the monuments. This uniformity, together with the persistent street plan and the housing of workers in rows of quarters obviously under their own building, argues some powerful, practical political control centered perhaps on a priest-king like those of Sumer, a ruling building, the organization of labor, and the collection and storing and storage of grain. Perhaps even more surprising is the uniformity in time: the lack of change and the fidelity of the

regular plan of streets. So great a stability is unexpected in
any sequence.

Then the whole civilization collapsed, and the latest remains
are crude huts built over the ruins of Harappa itself. Vari-
ous points point to growing raids and incursions of barbarians from



Impression from Mohenjodaro, with an example of the Indus script.

culminating with the Aryans in about 1500 B.C. They, like other Indo-European language, were probably part of a general movement of Indo-European-speaking tribes who had already settled in Babylonia farther west. At any rate it was their history and their gods which were celebrated in the Vedic hymns, and the history of the Harappa people, who were thus excluded from memory by the conquerors.

This hardly mean, of course, that the culture of the great cities was blotted out, or that the Harappa culture did not continue in Aryan life and religion, and perhaps the very nature of the

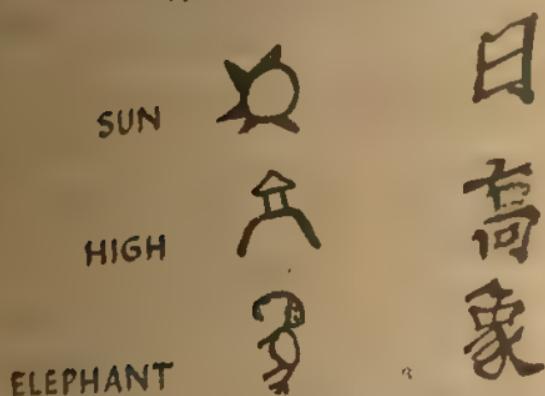
Aryan gods, as all these were finally handed on to later Hindu culture. Surely Harappa left some kind of a legacy, and the vases themselves even suggest other Hindu ideas: intense conservatism and ritual purity. For the last, note the baths, and the quantity of broken clay cups around the walls, apparently meant, as in modern India, to be drunk from only once.

The dynasties begin in China

Whatever the influences that spurred civilization in Mesopotamia and India, they also reached China a number of centuries later, and a parallel civilization arose there. Such influences may have followed the same path as the Neolithic connections to North China in the bend of the Yellow River. Here the culture



A Shang Dynasty bronze vase



These characters of an early stage compared with their modern equivalents. The idea of "high" was first expressed by a tower on a hill, and the same picture is now "written" in a series of rapid brush strokes.

China passed quickly into a bronze age with the Shang Dynasty, which dates itself from 1766 B.C. but is thought to have begun about two hundred years later. The use of the wheel in making pottery had already arrived, and so had copper; and Shang bronzes, large vessels with simple, strong ornamentation, were not only technically good but are also one of the world's great arts. Vastly preceded by the legendary Hsia Dynasty, which is supposed to have established a time count and to have charged the first emperor with reading the will of heaven through the study of astronomy, the Shang rulers were now presiding over an urban civilization, a well-organized army and a luxurious court, and were having themselves buried in sumptuous tombs with human and animal sacrifices, altogether reminding one of Sumer and Egypt. And writing appeared, possibly as a native creation based on a foreign idea. It is first known on oracle bones, shoulder-blades of cattle or turtle shells, heated to produce a pattern of cracks to be read like tea leaves (this shoulder-blade reading is called scapulimancy and is an old Far Eastern device for divining, applied by the Siberians to reindeer shoulder-blades). These bones were inscribed, and the characters used can be recognized as the ancestors of modern Chinese writing. It is

plain that they started even earlier as pictures, and gradually came the mass of Chinese "letters" or characters (not an alphabet) representing, like the Sumerian cuneiform, a mixture of signs and sounds.

The Shang emperors at last lost the favor of heaven, and were replaced by the line of Chou (1122 B.C. or later), then rulers of a small state in the west. Under them Chinese government advanced, and the empire spread down the Yellow River to the sea and on southward, the beginning of the expansion which centuries later had carried to the present borders of the country. The emperors had their ups and downs of power, and faced dynastic replacements, usually from the semibarbaric western states. But they managed always to supply a center of authority to which China as a whole returned.

As in earliest times, China was so far away from the West that she could have received only stimuli and basic ideas rather than full cultural forms, even though her Bronze Age civilization had a similar outline. Once started, Chinese culture followed its own paths, even when further influences (like iron) arrived. Chinese culture is distinctive, and Chinese inventions, such as paper and printing, have put the West in debt to China in turn.

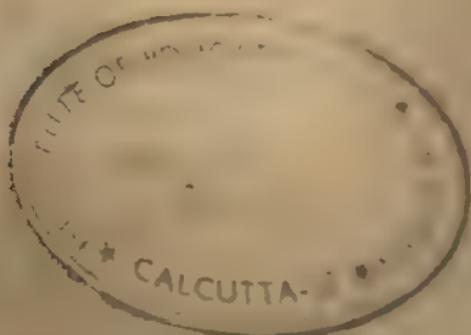
A great Chinese interest has always been devoted to the techniques of government; and the fall of Shang and the rise of Chou is cast in legend as a story of imperial oppression and immorality replaced by liberality, morality and a decent feudalism. When you remember that Confucius, the good Machiavelli, had government as his first love, and that ancient Chinese education led through long study and examinations to positions in government, then it is less surprising to find that the Han emperors (206 B.C. to 220 A.D.) were already trying out many modern-sounding solutions to farm relief, tax problems and money panics.

Japan deserves a word, not as a cradle of civilization but as receiver of it. She has in fact been something of a specialist at this. Enjoying an insularity like Britain's, she has been a picker and choicer, consciously adopting or rejecting at will, from the time of her founding as a nation to her first taste of conquest in 1845,

its prehistory, unfortunately, is still much clouded, but it does not extend very far back; three or four thousand years before Christ, perhaps, into a late Mesolithic, as far as has been discovered.

Pottery-bearing remains go right back to the beginning (in the Jomon period), preceding any agriculture or animals. These remains begin to show, in cord-marked pottery, pit houses and rock-work, signs of northern Siberian influences, and also, later in the period, agriculture and cattle, probably from Korea. Then a later Neolithic culture, the Yayoi, appears in the south and spreads north. Now the White Ainu must have been the makers of some phases of the Jomon culture, but were they the sole proprietors? They certainly once covered most of Japan. Were the Yayoi people Mongoloids from Korea, who partly mixed with the Ainu, and partly drove them north? And whence come various peculiarities of Japanese life, like tattooing, light houses in a cold climate, & so on, which look like intrusions from Indonesia?

Chinese bronze was imported in the Yayoi culture, but Japan never had a bronze age. Instead, the Yamato people, with iron and horses (some of the latter were already present), arrived about 200 A.D. and founded the Japanese nation, and the only dynasty Japan has ever had. Out of their clan organization grew a powerful military feudal system. Japan continued to get ideas from the mainland, such as rice, the plow and Buddhism. Indeed, in the seventh century A.D. the Japanese sent a committee to China in quest of good ideas and took over such as pleased them, and they did the same thing in the last century, with visits to England, Germany and the United States, after having resisted European influence for a while, until they saw the realities of the situation. This move to meet diffusion more than halfway, by a whole culture, is something practically unique.



20

Egypt, Crete and the beginnings of Europe

Our own prehistory, that of Europe, drew to a close as civilization spread slowly into the West. Here, in the Mediterranean, its early home was Egypt. Greece and Rome, more tended to look on Egypt as the mother of civilization, but this certainly gave her too great a share of the credit, for she drew older sources in common with Sumer, and continuously thereafter on the Near East and Mesopotamia. Nevertheless, she lost her individuality, and there is no indication that her writing or her pharaoh system were not her own developments, even if the basic notion of writing might possibly have come from Sumer. Lying in the corner of Africa, mostly in a narrow valley flanked by the desert, she was more isolated than Mesopotamia from invited intruders.

Egypt had a rich Neolithic culture, if you have not forgotten before 4000 B.C. in the Faiyum Basin. This was succeeded by a sort of Copper Age culture, the Predynastic, appearing in the Nile Valley itself, known not from its villages but from its cemeteries. In these, the dead were outfitted each with some household goods and ornaments, and buried in a crouching position in a simple pit in the ground. There was plenty of well-made pottery. Men had a few weapons and women a dressing-table kit of various kinds, particularly a comb, some green earth for painting the eyebrows, and a small stone palette to grind this paint on. Copper tools appeared, and later on they were being made by a regular casting process.

These villages must have been growing up all along the Nile, and in the Delta, doubtless with more complicated culture and

possible than we can discern. Then about 3100 B.C. the dynasties began, and civilization almost jumps into being. Actually the people's farming life, with no new frills, went on for ordinary purposes; the new thing was the pharaoh, and the growing arts and crafts which surrounded him and his court, imposed on the top. You might represent early Sumerian society by a ziggurat, with the temple corporation or the king as the small top block, the privileged and noble classes as the next block down, and the common people as the biggest block at the base, then you might represent early Egyptian society by an obelisk, one central figure for the pharaoh and his governors rising high out of the dead level of the population.

There may have been some knitting together of towns or villages already, but the first pharaoh, Menes, conquered all of Egypt and gave it a unity which it almost never abandoned. His successors established the fixed administrative districts of Egypt, the nomes, and imposed a new ritual in which, from Menes on, the pharaoh was not only the descendant of Osiris and of Horus the falcon god, but also their divine reincarnation, and the living embodiment of Menes, the uniter of Egypt, as well. The pharaohs' gift to Egypt was not only unity but administration, keeping the peace internally and defending the valley from the outside, undertaking public works, exercising control of irrigation, and studying the flooding of the Nile. The result was to make the land highly productive.

But most of this came back to the benefit of the pharaoh rather than the people, since he took it into the next world with him. The simple pit grave of Predynastic times turned into a deeper one, then into an underground chamber; and in the very first estates the royal tombs of Abydos had become small buried apartments. Food, toilet kits and copper tools accompanied the dead as before, but now also gold, turquoise, lapis lazuli and other precious things. As preoccupation with the dead grew, the Egyptians tried to preserve the body (the mummy was the "new," indestructible body, Osiris revived). More and more wealth was buried with the king, including slain servants and eventually

whole miniature households in model form, with orchards, houses, cattle and so on, along with quantities of the actual goods.

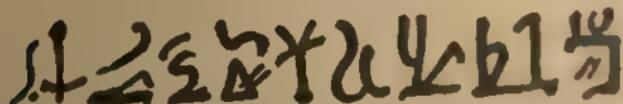
Above the underground tomb there shortly began to be a mastaba, a flat mound of moderate size, made of mud or stone, and having chambers within itself. Finally, still in the Thirteenth and Fourth dynasties, about 2600 B.C., the pyramids were built. These great works were not made again, but the underground tombs and all the riches ran right on down through Egypt's history.

Now this, and particularly pyramid building, is a major business, done during the pharaoh's lifetime over many years, thrown together by an undertaker on the king's demise. Of the food grown in Egypt, the farmers took their livelihood, and the government took the rest. Much of it was converted into work making it possible to take 100,000 men off the land and feed them while they cut and transported stone blocks. More of it was concentrated or refined in this way: expeditions went out for timber to get the wood, the gold, the copper, and various kinds of riches which were not to be had in the valley of the Nile, and these materials were made into ornaments and luxuries by corps of craftsmen. And then this distillation of so much of the country's wealth was put in the grave with the dead king. Thus, while an ordinary farmer was part of a civilized nation, with tax collectors and governors, his daily life was much like that of Neolithic times since his lot had not changed and he was still, and for a long time after, using stone tools.

Nevertheless, Egypt had the forms of civilization from the beginning. Even if bronze did not become truly general until the Eighteenth Dynasty, after 1580 B.C., work in copper showed a real knowledge of metal during the Predynastic. And the presence in Egypt of the same arts and the same kind of advanced government and cities as in Mesopotamia and the Indus Valley means that we should look on the Bronze Age as beginning at the same time, before 3000 B.C. as a rough date, when the dynasties commence.

Their mathematics, which had to deal with land areas, with problems of pyramid size, and with amounts of labor and material

and d. was good. The Rhind Papyrus of 1700 B.C., eighteen feet long shows how to do a variety of practical problems, by methods of reckoning harder than ours today but effective all the same. Writing appeared, clearly developed, in the First Dynasty, in the famous hieroglyphic script using little pictures, and was already at this time partly phonetic, or a mixture of sounds and symbols. The hieroglyphics continued in use, and there shortly appeared a simplified version of the same signs, the hieratic script, for easy writing. The Egyptians also early devised an alphabet of 24 letters for simple sounds alone, but they made the sad error of "simply adding these to the rest of the mass and so not actually 'inventing' the alphabet."



An example of Egyptian writing shown both in the hieroglyphic (above) and the simplified hieratic scripts. (Translation: "What is the number being referred to?")

They did better when they came to the calendar. Now there are several obvious ways of adding up time. You may readily observe that every twenty-four hours there is an alternation of light and darkness, called a day. Also, about every twenty-nine days the moon goes through all its phases and appears as a new crescent in the evening again. Finally, and this has no such obvious marking points, there is a succession of seasons lasting 365 days and a fraction. Now these various fractions of days cause trouble: they keep the moon "months" from being neat divisions of the year, and the days from being neat divisions of either. Yet the new moon is something so obvious to anyone that it has almost always been seized on, formally or informally, to divide up the year. Even the Mayas, who understood the discrepancies fully, and who

made an arbitrary year of twelve months of thirty days plus a month of five, all at the same time that they were using a 365-day count to write dates with, nevertheless seem to have felt that they must keep track of the moon as well.

But the Egyptians were less concerned with long-time dates, and in fact began counting years all over again with the reign of every pharaoh (something which is responsible for our being certain about the older dates). Instead, they were interested above all and foremost in the exact measure of the year itself, so as to know when to expect the flooding of the Nile; and they achieved this by-passing the moon and using the stars. They began the year with the day on which Sirius, the Dog Star, has passed the sun so far that it may be seen rising in the east just before dawn, on the fifteenth of June, close to the time of the flood. So they threw out the moon, divided the 365-day year into arbitrary months, as did the Mayas, keeping track of the error from the true year at the same time (instead of correcting every four years with leap years as we do), and so gave us the kind of yearly calendar we use ourselves.

The Old Kingdom, the first six dynasties, was a glorious time for Egypt, seeing the unification of the land, the new rulership and religion, the broadening of writing and science (which may have gone back into Predynastic beginnings yet unknown), and the raising of the pyramids. Then, about 2500 B.C., the government came apart at the top, with the priests and the princely governors renouncing the king's authority and setting up local dynasties.

As the royal power foundered there ended the time when the pharaoh alone owned everything and governed through others, and viceroys who were of the royal family themselves. As technical progress slowed down, but the poor people rose in revolt, and themselves began to enjoy some of the good things of the world, and to aspire to learning and office, while the patricians were humbled. When Egypt was once more united, 2160 B.C. in the Middle Kingdom, under the Theban pharaohs of the Eleventh and Twelfth Dynasties, the commoners under the "just laws" enjoyed their new rights and the richer life. But the

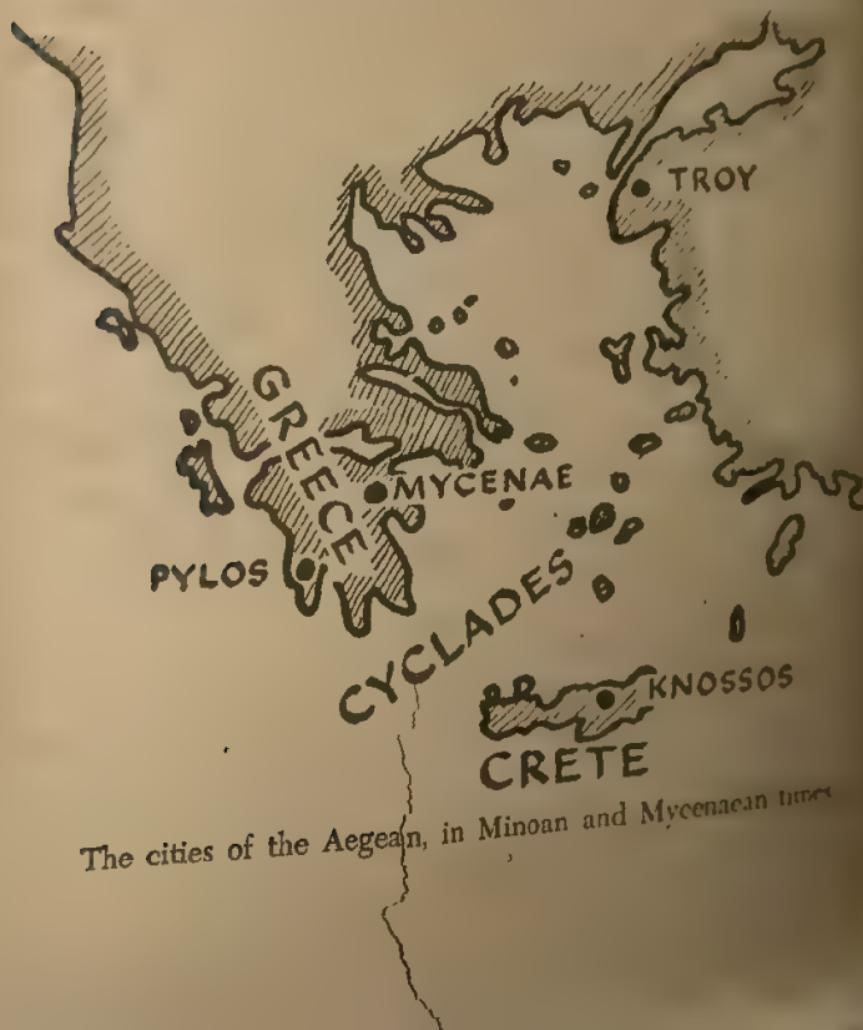
new at last introduced, and Osiris, as judge of the dead, became the national religion, replacing the narrower old cult of Ra. From 1788 B.C. on there was a second interruption, this time an invasion from Asia by the Shepherd Kings. These invaders brought in horses and chariots for the first time. Finally, in 1550 the native kings of the Eighteenth Dynasty drove them out and established the New Kingdom; not only that but they now went across into Palestine and Syria and conquered them in Egypt's greatest expansion, which put her in close touch with the later Mesopotamians and with the eastern Mediterranean generally.

At home this dynasty had tombs of great magnificence. Toward the end, the young Akhenaten, whose wife was Nefertiti, overthrew the worship of Amon, who had become the principal god, and all other gods, Osiris included; he decreed the worship of Aten, another manifestation of Ra the sun, with himself as his priest. Thus he beat down and expropriated the powerful priesthood, and took the religious reins in his own hands to enhance the power of the kingship. This was not popular. His son-in-law and heir Tutankhamen felt forced to reform the reform and to restore the old gods; even after this concession he had to have Akhenaten buried secretly, and was buried in a secret place himself while his own successor defaced all records of him. In that little news of Tutankhamen came down through history, and his tomb survived the robbers almost completely and became the latest find of Egyptian archaeologists in our times.

Already, in 1350 B.C., Egypt's great days were over. From the Eighteenth Dynasty on, the kingship again became shaky and the priesthood powerful, until native control gave way to outsiders from Libya, Nubia, Ethiopia and at last from Assyria and Persia, Greece and Rome, with only occasional home rule. As in the case of Crete, the period when Egypt was one of three small incubators of Bronze Age civilization was a thing long past, lost in trading wars and empires of the Near East.

*The Aegean:
Minoans and Mycenaean*

Nevertheless, she had had her effect for Europe. She did not leave us a great deal directly. But she did serve as a focus in the West of commerce and knowledge, which drew civilization westward, and joined with Mesopotamia in stimulating the eastern shore and the islands of the Mediterranean. Cyprus, off Syria, was so rich in copper that its name has given us our word for the metal, and Cyprus soon began to profit from its export. The Cyclades, in the Aegean Sea, with no Neolithic remains—they are not a good place for farmers—found themselves thickly populated in the “Copper” and Bronze Age with a clearly prosperous people producing copper, marble, obsidian and other materials, this is a





Reconstruction of part of the Palace of Minos at Knossos, on Crete

such culture rising out of nothing in response to the trade of the civilized lands, right at the beginning of Mediterranean commerce. But later the importance of the Cyclades subsided. It was the island of Crete, to the south, which rose and became the great steppingstone between East and West.

Certainly Crete was well situated to be important at this moment. It lies between Egypt, Greece and Turkey, or Africa, Europe and Asia, on the great routes of the time; on the routes, moreover, by which tin would come southward from Europe by western Greece and copper westward from Cyprus, so as to make Crete a center of the bronze trade. She had an old Neolithic occupation, by stock breeders, until sometime after 3000 B.C. when she opened the copper-using phase of her long Minoan civilization. Here we are not talking about one of the cradles of civilization but about one of its schools: this was not a valley-bottom development but a maritime one, fed by trade. The cities were seaports, and faced on harbors rather than farmlands for their dependent. They sent out olives and wine, cloth, bronzework and jewels, in exchange for grain and metal, and prospered by

trade, bringing back ideas which they remodeled for themselves. Cretans of the first phase made use of gold and silver as well as copper, and built good-sized houses, probably of two or three stories. Bronze came in about 2400 B.C. or later. Trade expanded, and so did the cities, and by approximately 2000 B.C. such buildings as the great walled palace at Knossos were coming into being. The towns themselves were not walled for defense, perhaps because Crete was a naval power. But the palaces in the great towns were suddenly destroyed about 1800 B.C. Was it invasion, of which there is no sign, or was it earthquake, of which there have been many signs, from that time until this? The palaces were rebuilt and enlarged, and between 1700 and 1400 B.C. Crete had her most magnificent period. Egypt, under the Hyksos, was less of a rival or of a trade partner than before, and Crete was trading particularly with the Near East and with Greece until, about 1400 B.C., the mainland Greeks overthrew her cities for the last time and brought about the abandonment of the palaces.

These events are all hazy, and known only from spadework.



Minoan scripts. Signs in the top row are in the hieroglyphic script showing their pictorial nature. Those below are in the Linear A script showing how they are simplifications of the hieroglyphic.

in the case of the Indus Valley civilization. For, like the Indian people, the Minoans had their own script, founded in crude hieroglyphs and pictographs going back to the copper phase. Much of this writing survives, but the script was never deciphered at least until 1952 A.D., and future reading of it will probably reveal that the writings are largely about trade. So we know nothing exact about dates and kings. And we cannot tell too much about the

city, except to see that there were princely palaces, suggesting rulers of some grandeur, while at the same time other records seem to show that the common people were not paupers or slaves to a despot, but prosperous merchants and workers, townspeople sharing fully in the country's wealth, and probably the most fortunate people in the world during their time. The texts mention their occupations: king, herald, armorer, bowmaker, chariot property owner, tenant, shipbuilder, longshoreman, slave, bath attendant (female) and a host of others.



A Minoan fresco showing the bull-leaping game

More of the tale is told by the copious seals and sealing impressions and by fresco paintings and other objects of art, which allow us to study the Cretans' life even if we cannot yet read what it was. We know the stylishness of women's dress—highly developed fashion, not at all barbaric—with full flounced skirts and deep waistlines, and bodices which not only did not cover the bosom but went out of the way to expose it. Men wore only a waistcloth. We know about their games, especially their almost impossible kind of bullfighting, or rather bull-leap, in which the player apparently hooked his arms over the horns of the charging animal and allowed himself to be flipped onto the bull's back, finally ending with a somersault off the animal's hindquarters. The most striking thing about the art is the style of the art itself. It is free, fresh, bright and lively, with a spirit quite different from the kings and phalanxes of Mesopotamia or the staid re-

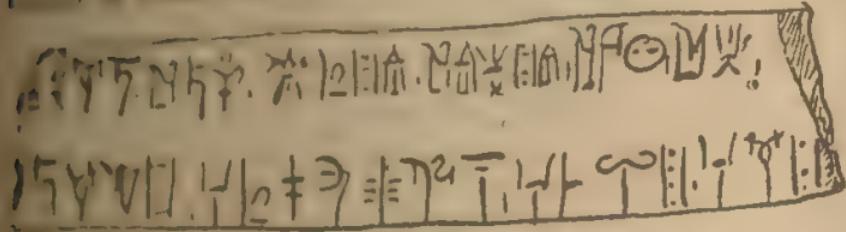
ligious and funerary paintings of Egypt. It shows about deities, like the Snake Goddess, but it does not go to royal personages; instead it portrays every kind of animal scene, naturally and vigorously, and yet with its own. This art may have drawn on Egypt for some influences, but where painted Egyptians stand still, pale, move; it was the forerunner and source of the frescoes, and that is what it suggests. More than anything else, the independence of the Minoans from Asia and their cutting off theirs as the first European civilization to abstain on Crete from its sources in the East before being planted on the mainland.

This planting was accomplished in two steps. I shall begin my story of this book with the second. The first was the bringing of civilization's rudiments to Greece. Now southern Greece, Mediterranean, Copper Age culture and population, had been influenced by that of the nearby Cyclades, and later began to receive other tribes of bronze-users who were now entering Europe by routes to the north, about 2000 B.C., and some of these people shortly came down into Greece and founded cities. These were the Achaeans, speaking a very ancient Greek tongue. In succeeding centuries they came under powerful Cretan influences, and their dress, art and culture responded to this fashion. But while they thus developed a sister civilization, they kept their independence.

This was the Mycenaean culture, named for the citadel of Mycenae, which may actually have been built by Memnon, just as the palace at Pylos may have been by Nestor; both are about where Homer said they were. Here the kings were rich in gold and gaudy jewelry, and the tombs yielded quantities of inscribed clay tablets. These were written in a version of the Minoan script. This, the Linear Script, appears to be an adaptation, and an improvement, of the Greek, derived from the original script used in the little-known Cretan language. It is this Linear B which the clay tablets tell something about later Achaeans and Mycenaeans.

even name some of the gods of classical Greece: (appearing as A-ta-na Po-ti-ni-ya), Poseidon, Demavus and others.

The Crete fell, pupil became master and master became slave. The indications are strong that the later princes of Crete, before 1400, were actually Achaeans Greeks,



and that the Linear B script, found at Knossos. It is an inscription concerning a chariot. The probable translation, lower tablet (the left side is a broken off end piece), reads: "[Horse-]
[drawn] chariot, [with] bodywork fitted, supplied with reins; the
[bodywork] jointed with jointing of horn; and the pte-no is missing"
(the word "pte-no" may be).

Meanwhile, and the mainland script, Linear B, had intruded upon Crete, and the other form, Linear A, which was proper to Crete. However, Cretan culture carried on without interruption, the Achaeans having been on the thrones, until the final burning and destruction of the palaces about 1400 B.C. This may very well have been brought about by a war of Greek against Greek, with rival Achaeans from the mainland overthrowing Achaean dynasts on Crete. The Achaeans, however, still persisted awhile, slowly declining, and their influence still affecting Greece, but the power of Crete was broken, and the palaces were left to ruin.

Western Europe, a road-show Bronze Age

After the fall of the palaces of what Crete had first established, the center of civilization turned toward the Aegean, and its influence spread, and the Greeks expanded their

power down to the time of the war against Troy, a region which had beginnings something like their own. What about the rest of Europe?

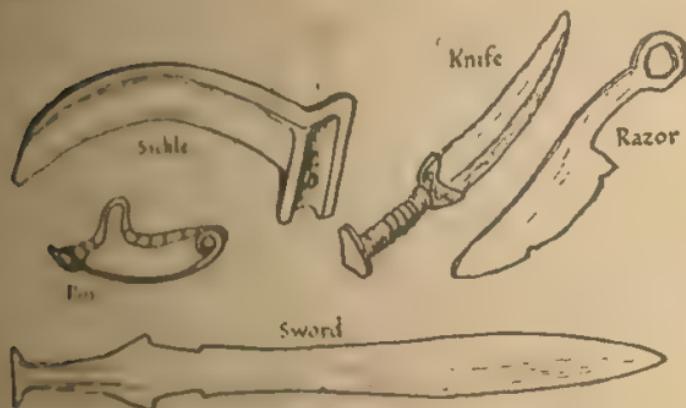
We left her, in Chapter 9, in the late Neolithic, as the Megalithic culture of big stone monuments was spreading up the Atlantic coast. This Megalithic was probably associated with the Copper Age culture in Spain, which did not reach most of Europe at all. For, along with such influences coming out of the Mediterranean, bronze-users like the Achaeans there were also coming up into Europe from the southeast. Just as people established themselves in Italy, in the Tarentine Gulf, where were fortified villages of pile dwellings. But in the north and west of Europe there was less turbulence, and the use of bronze came slowly during several centuries.

Here it produced little change. The Swiss Lake Dwellers adopted it, but they simply began using bronze objects, casting them overboard along with their other goods without significant modification of the Neolithic culture. Europe in fact had to be pried open by southern trade demanding tin, from Cornwall and Brittany, and amber, from the Baltic coast. England celebrated the advent of the Bronze Age by changing burial customs from oval to round, when an addition to the population came from the region of the Rhine with a particular kind of pottery, the beaker, and perhaps bearing the religious notion which went in the building of Stonehenge and a few other monuments of a peculiar kind.

Now Stonehenge has been dated by two different methods, about 1840 B.C., and even this may be rather early for the beginning of the British Bronze Age. In any case, Europe remained highly provincial, to say the least. Mesopotamia could rear civilizations without the knowledge of bronze, between 3000 and 2000 B.C., and Egypt lacked bronze much longer. When the Phoenicians crossed the English Channel a thousand years after the great empires had risen and fallen in Mesopotamia, nevertheless, the yet western Europe clung to tribal life and went on for many centuries more, down to the end of the Iron Age.

As a city-state appeared, Only gradually did the population, taken up, react to trade, and finally, quite late, begin to create town life of its own.

Very early there a high variety in culture. Bronze objects themselves changed and improved as people learned the manufacture. Battle-axes, swords and daggers were the important ones. Bronze was also used for other objects and adornment, such as in the form of bracelets, pins and safety pins. The



Objects from the Bronze Age of Europe

Europeans were beguiled for centuries by this last invention, safety pins plain and safety pins fancy, doubtless for the purpose of holding a cloak in place.

Objects of bronze are found far less in the usual living sites or than in burials, and above all in hoards, probably belonging to noblemen or merchants. Some of these latter collections have contained thousands of pieces. Such finds suggest that, as in Crete, bronze was expensive and not for common people, but intended to arm the rich and the noble, and so to increase their power in society generally. Burials which include whole sets of bronze articles seem to tell such a story. If the Mycenaeans were a civilised imitation of the graceful Minoans, the Bronze Age peoples were not in the same class at all. It would be uncharitable to call them yokels, for they were not even the equals of a civilized society. One of their brightest spots

was Ireland, where gold was given away in neckbands.

Then came the Iron Age. In the North it began about 1200 B.C., when the life of common people was transformed by the development of some very good iron, the use of coinage, the invention of money, the devising of an alphabet, the introduction of the plow, the drastic reduction of the price of metal, and the use of iron. In Europe the Iron Age brought the Celts, who, like the Hittites, put swords into a lot of new hands. When the Celts first came they at once saw the beauty in the Iliad and the Homeric epics.

But the event did bring about the downfall of the Mycenaeans in a sort of way, in the planting of civilization in Italy. The Achaeans, the Achaeans Mycenaeans of Greece, had lost their power, their memory, their last triumph over Crete, and lost also the secret of their rule of the Aegean Sea and their leadership of the Greek culture, they were taken from the road to civilization and beaten by the iron-using Dorians. A little later, the iron-using Villanovans, came down into Italy and, followed by another related group, the Hallstatt people of Austria, they brought iron and war into much of the rest of Europe. There was no noticeable improvement culturally over the time of the Achaeans habitants. They had iron, and they were more warlike. These are the main differences. They were relatively poor, living in only villages and a few forts, and carrying their wealth, particularly swords, into iron, while still leaving behind them ornamental objects in bronze.

It is not clear just how iron arrived in Greece, or in the Balkans, or how much it came with new tribes, or whether it came simply as a technique. But the Dorians, who had come down from the north and attacked the Achaeans, had been building up their Mycenaean culture from the time when the Dorians robbed and pillaged and destroyed the Mycenaean culture, and put an end to the great civilization of Crete, Minoan, and a dark age followed. The Dorians, however, in the end, only a darkness. If the Mycenaeans had been able to hold

and the Greek cities did not vanish. As usual, some of the Greeks had come and then married it. Some had come to teach the speech to civilization, the others to teach the Greeks to Europe, and thus accompanied by the Greeks began to appear in the islands and on the shores also appeared in Greece. And so Greece was embarked on her own course, a little to follow, built by the natives

Iron Age origin.

Now we have heard of men before books. For Europe has a history which makes our own heritage, there is nothing like it. While Greece was flourishing in the sun, the west was occupied by Keltic tribes, who came later. In Late Iron Age, with its richer agriculture, its growing town life, and its cran-

and Ireland

the Celts were still tribes pure and simple. As the Romans advanced, they were conquered and weaned away from their tribal ways. They turned from the ancient pattern in which the chief was the law, and it is not murder to kill anyone who goes against him, to the single law and state of Rome, for all the Celts were converted to the simple European Iron Age. So when Julius Caesar and the orderly process of Roman conquest came to Gaul and France, they fled across the sea to Ireland. There they left, to carry over every of some phases of the final development of the Celts, and to drag them back into prehistoric times again, and into mythology. Or you can read about the Celts in the *Mythology*. But that is another book, and if you want to know more about them, as completely like Caesar, then you must turn back to me and my story.

Epicurus

It is my claim that it is actually possible to learn something from the past. At this suggestion, however, the historian slips into his arsenal of reasons for avoiding history. He comes out again with "History never repeats."

He is right, of course, but next to its idiot brother, "Lightning never strikes twice in the same place" and the two are certainly akin.

The lightning may not strike many things twice, but lightning strikes buildings, and it strikes the Empire State Building again and again. This is a long-term comes by. If history never plays previous scenes over again, it is because changing culture changes society. But this has not prevented a historian from preventing Churchill from knowing what England will do when Hitler attacks. **I has done before.**

What does it add into the life of our descendants, by projecting us into the past? What does it add to ourselves? Well, what have been the two great events of the last forty thousand years since modern man first appeared? After foraging for his meals for most of this time, man has made the last two great changes in his affairs. In the first, he concentrated his food and settled down to tribal agriculture, which gave him certain ways to make it easier to string together a tribe. This was the Neolithic. In the second, he invented cities. As civilization, large populations were too large to live in small villages, to form states. This happened because of the perfection of farming and the supply of labor. This was greatly helped by other inventions such as the use of beasts for power and not fo-

Has any other such major turn in history been made? Are we still improving on the basic state of affairs? The Bronze Age brought into the Middle East about 3000 B.C. certainly there was a period, thousands of years long, when invention simply cut and polished away at the rough edges of a beginning civilization. This not only produced new tools and the nascent sciences. It also produced Greece and Rome. At about the same time it produced the greatest religion in humanity above all called any who could hear to peace. Not so much as far as beliefs and ethics go, and so much more than everything else it has meant, it should be looked upon as one of the perfecting developments of civilization, as civilization self progressed. Christianity indeed did much more than act as a sort of safe international bank of culture. Civilization itself was having something of a depression in the Dark Ages.

Very likely we have already seen the advent of the Industrial Age, though I reserve the right to wait two or three thousand years to be sure of it. It would be hard to say just what it kept back, and we have no very good name for it, though it is the Industrial Revolution. It had its seeds in the beginning of modern science, from the seventeenth century on, by which man began to be understood broadly for the first time.

It was as though, earlier, people had looked at the world, seeing a little something on each, without realizing that they fitted together to make a big picture. When the last piece was fitted, and as the finished part grew ever larger, the Industrial Age was born. The secrets of nature were cracking open, and men cover and invent deliberately, and stop their labor in the darkness of alchemy.

And one great result was the finding of new power, not from muscles but from molecular reactions, steam, gunpowder. We read in school about the machines that were invented: cotton gins and reapers, spinning jennies, steam motives, some of which could run by hand or by steam, new power. But the real essence of this age is the new power.

had taken effect before the use of steam, they were like the Neolithic Age of the ancient Middle East, which needed to see them their true meaning.

We cannot say that "Atomic Age" is a pretty good name, and we do not mean to belittle it. For we might easily look on our present stage as being in the formative period, like the Copper Age or the Bronze Age, wherein the experiments and inventions were made which established civilization in its full form in the Iron Age proper. We have made the experiments and we know what we have done and the chemistry. We have the alloys, and the materials, and the machines, and the understanding of how to bring them together to do what we want to do, whether to run a dentist's drill or a power plant. Are they just about to usher in the true, persisting stage, or are they still molecular, power, and on machines which do not make as well as make them? These things are now visible on the horizon: we have electronic computers with memory, and at the beginnings of mechanical brains, and anyone who wants can at least have a machine in the kitchen which will tell him to stop washing and start drying.

Now we have already given ourselves up mentally to the future. A few years ago, bad children shot the insulators off a power line and life on the Cape well-nigh went back to the Stone Age. Men turned to the grave. Few had water; water pumps could not get gasoline (no pumps); it was just as well, because the street cars had no traffic lights to keep them from running into each other. No light in the streets; no light in churches, no light in the city. Food was eaten raw in houses with electric refrigerators, because they got the colic unless their mothers warmed the food over a kerosene stove, which had generators. The police also had to depend on men from Neolithic perils to health by storing their guns in their cars when the drugstore refrigerators stopped. When the power failed, we went all the way back to the Paleolithic Age, because the kerosene lamps could not work and the cows, nearly dead from lack of milk, lowered pitifully while the neighborhood

sorrowfully stood around in total ignorance, and by hand.

Such is the tomorrow that is taking shape. Our society looks safe; there will be a world government, a difficult birth, with all the cultures who do not reconciled; and both the One Worlders and the others the present may be wrong in their hopes. In the past there were a visible trend in culture, here it is to Mesopotamia, larger and larger states followed by if nations in Europe could proceed even temporarily like Rome, Austria-Hungary and Britain; then the distance and the growth of giant economies, which can spread news around the world faster than around a Neolithic village, certainly are doing everything along.

But do not ask when, or what kind of world government we will have. I only assure you that our social problems are greater than our mechanical problems. Our culture passes through an engineer, and will push on fiercely to turn the door of time into the kitchen of the present, though I think that the discoveries to come will be in biology, not in engineering. How can we really predict much? If less than three thousand years intervened between the first farming and the first civilization in the Near East and the Americas, and if less than two thousand years fell between the first civilization and the first great advance in science and industry, then how can we possibly expect to be ahead of us except as a glorification of what we already have, tailing a few thousand years more?

For we cannot guess what new departure may be taken in the age after the Atomic Age. Could hunters have foreseen the life of farmers? Could the farmers have foreseen the Bronze Age? Could the Sumerians have foreseen the Iron Age? You can help yourself to any brave new world you like, but culture is a very changeable thing from one thousand years to the next, and you cannot foretell its distant shape. You can only see the outline of the next cloud that comes by.

Turn on to your television set if you like, and sit before it for a while. But I think you will find their faces and their haunts distressingly familiar. And as for other planets, with different temperatures and gravities from our own, it seems a little hopeful to think that intelligent beings in nearby space who have arrived at the same level of 'civilization' in the same few thousand years, coming from a long way off, will have developed a variety of vertebrate Primates which gives them hands, arms, and upright posture.

The proper study

That kind of forecasting is not the main business of history. It is not about man himself, and trying to peer into a future of which we know so little compared to the understanding of the past which we might achieve by looking at men and their institutions separately. Culture is a merry-go-round but, though it may be as gayly as it may be, the real thing is not the machine itself but the people riding on it, as it goes faster and faster. Man is the more constant, because he changes biologically at a very slow rate, not like mercurial culture.

For the very same kind of man lived thousands of years ago as he does now, and then when farming suddenly presented him with a very new and very weird problem of living in larger groups, he was still perfectly capable of meeting it and forming new social organizations. And, as culture then shot up, ordinary man was still able to keep pace with some of the most remarkable changes. Who would have thought it, ten thousand years ago, when we finally understand how it happens that man can become much too intelligent for his own good? We will know an important secret when we find in the first place. And yet even this is not all. Chimpanzees, also, seem to be able to lead. And why should they not have better color vision than most of us?

how? Because they have a poorer sense of smell? Here we are up against some of the more devious workings of evolution, in which there seems to have been a certain amount of luck.

But if we do not yet know everything about evolution, we are not thereby relieved from trying to understand human nature through evolution. There are still people—in diminishing number, it is true—who feel it is wicked to believe that men evolved out of simpler animals and who, at any rate, are greatly distressed at the idea themselves. Doubtless they think that man cannot be an animal without being a beast. Certainly we will all be much happier when evolution has ceased entirely to cause qualms, and is quietly accepted like the idea that the earth goes around the sun, another opinion which was once good, for a visit to the Inquisition.

For there is every nobility to animal life, and—do not laugh—man is a noble animal. He is a creature who got where he is through the fire of evolutionary trial, which made him ever and ever fitter for his world and for the possibilities toward which his kind of body and brain (that of Primates) had pointed. His animal background is a billion or two years long, and it is a good background to have. He has a sound physique, intricate as it is, and sound kinds of natural behavior, unless he is actually the joker in the animal kingdom, which hardly stands to reason. He comes by his title of the highest form of life by legitimate descent. His existence is no cockleshell upon the deep, for he is healthy, long-lived, adaptable and well adapted; and he has moved into a cultural world which puts the rest of nature at his disposal.

This existence is not entirely an untroubled one, it must be granted. Humanity has severe cultural indigestion on occasion, and the present seems like one occasion. Cultures are clashing, spoiling the harmony which any might maintain by itself. Europeans ban Indonesian head-hunting, and Indonesian culture backs. Westerners offer the Middle East an oil economy, and the Middle East, the provider of farming and of civilization, now has a culture so backward that it cannot cope with this offer except by surrendering to it. Inside a rapidly changing culture, like our

own, brash new parts buffet crusty old parts until the latter crack and fall or, more usually, change in nature without changing in name.

And what about ourselves? How civilized are we? Are we all civilized or only some of us? You can call a culture "civilized" when it has cities and a bread trading economy, and when some of its citizens are similarly cosmopolitan as individuals, meaning that their loyalty and responsibility are toward the culture as a whole. But it may have in it a great class of people who could be called "Neolithic" personally, not because they are farmers but because their loyalty is to their own little tribe, the we-people, and not to society as a whole, and who take very poorly to being transplanted. Then, of course, there are those social gibbons and baboons whose loyalty is to themselves alone.

But all this is doubtless largely due to degrees of education and upbringing. Perhaps we could actually have a civilization all of civilized men. There are other differences among men—between brothers—coming from the chance combination of the multitudinous genes a man receives, and this kind of difference must always be present, from its biological nature. Hence, inevitably, some men must be more teachable and more inventive than others can be.

Does this mean that, starting from the rock-knocking of which Sinanthropus was capable, the demands of human living have begun to move up along the scale of human intelligence and ability, until they are putting severe pressure on people at the lower end? It is true that kitchen apparatus is beginning to look as though it needed a female engineer to run it, but otherwise daily life is nearing the push-button stage and putting a mechanical strain on nobody at all. In fact it doubtless encourages simpletons to sneer at Navahos and Zulus who could certainly push a button with the best of them if they had buttons to push.

No, if our culture is putting a strain on the least able population, it is doubtless in the hidden intricacies of political life, at which every man is his own expert no sinanthropoid his ethics or his approach to his own

For human affairs today demand both brains and responsibility. These are things which the baboons among us despise and deride, as the marks of an egghead and a do-gooder. But the simple fact is that, after a million years, culture has begun to rush forward and overtake natural human mental and social capacity, and it is not going to ease up on us. We are probably going to need all the brains we have while we are waiting—and it will be a long wait—to evolve some better ones.

Here we are probably at the central point of the relations between culture and the animal out of whom it grows. Does it mean we are racing to chaos? Are we going to fall into the gears of the thing we ourselves have made? Not likely. For we have two bulwarks that seem pretty sound.

One is the tremendous power of man to learn and to use his culture. There are, of course, individuals of limited or defective mentality, but we have no real evidence that most men are near the limit of what they might do—near the end of their capacity to react to culture—with the right teaching and exertion. It is true that one may be more impressed by the extraordinary skill of hand that a man or woman may achieve than by the degree of actual, articulate thought human beings generally use (as distinguished from making conversation by opening a mental closet of clichés and prejudices). It might make you think of chimpanzees, so quick and active and alert in most ways, but so deeply reluctant to speak the simplest words. But the horror of true thinking may be more a matter of culture and teaching than of the final boundaries of ability.

The other thing is the great potentiality of culture, the many possible choices still to be made, which we have not even approached. The hundreds of tribes and states have tried many solutions to any problem, and there are many others, still waiting in the wings like unborn children, which may do better if they can find a way to be admitted to a trial.

Let us look on some of our own greatest institutions in this light. As Europe moved from its barbaric Iron Age into civilization, it was faced with the problem of finding new parts of culture

by which to put a large society together. Rome contributed common law and common citizenship. Christianity gave Europe a common set of ideals and a freemasonry of knowledge. Later, the Northern peoples brought forth representative and constitutional government. Our American Constitution and the system flowing out of it is a giant piece of social and political machinery. It is no accident. It is a crystallization of a whole heritage of self-government by a free, literate society, which was put together by a group of men thoroughly educated in their own history, practical idealists who knew their culture well.

And look how it works, in cultural terms. It encourages different groups to co-operate and interact fruitfully so as to form a massive society like ours: it does not spell out leadership or triumph for any man or group of men, nor guarantee a workers' paradise, but instead calls forth the efforts of all to make an equilibrium which is generally right for its time, and will change when it is not right.

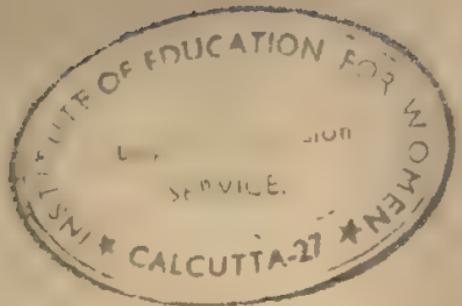
It recognizes some of the basic facts of culture change as well, in the interplay of liberal and conservative. Our Constitution does not even mention the two-party system! And yet it so works that the forces of invention and liberalism are always active, while the forces of stability and conservatism also never sleep. In the latter there lies a resistance to change which sometimes seems purblind but always is necessary, to ensure that the one change of culture is not revolution but evolution. Thus the introduction of the new is prevented from making damaging cracks in what is old; while the crust of the old is prevented from keeping out the addition of the new, when the new is needed to arrive at a fresh equilibrium.

So our ancient institutions, revised from time to time, have enabled us to construct a very large society, while still giving freedom and economic ease to the individual. This is a marvelous thing. Our constitutional forms are so complicated that it is wonderful that they are also so rugged. Forming large societies is a difficult achievement. Although their states were far smaller neither the Bronze Age peoples nor the Greeks had such freedom.

as we have. Nor, of course, have many modern states been necessary to point out how primitive by comparison is the culture of any kind. Such a borrowing from the Incas has been the first chapter of civilization, not the latest, and it lacks the comprehension of the nature of culture change which democratic government has.

The lesson? Only that we should be loyal to our country, understanding what it does for us, and that we and it must stick together. Culture must evolve or it must die, still evolving together like parquetry, and the only healthy change is one. One has no choice but to be a partner in all this. The most successful society is that whose culture calls forth the best from its citizens and responds to the best in them in turn. Society and culture are all one, Siamese triplets who are joined together, not separately. "Know thyself" means knowing all these. Says Lord Tweedsmuir, in his essay "The Other Side of the Hill":

An open and flexible mind, which recognises the need of reformation and faithfully sets itself to apprehend new truths, is a prerequisite of man's usefulness. But those who take this view will try to bring all change into harmony with the fundamentals drawn from the past. If the past to a man is like a dead hand, then in common honesty he must be anxious to revolution. But if it is regarded as the matrix of the future, whose potency takes many forms but is not dead, then he will cherish it scrupulously and labour to read its signs and shun the heady short-cuts which end only in blank disaster.



Author's Note

In this book I have tried to make a single story of the background. I have not attempted simply to make a series to history by telling about ancient man, nor to describe the primitive institutions merely for purposes of discussion. I wanted not to separate fossil skulls and island trade, but to bring them together, and so to make something understandable out of our past for anyone who might like to know about it in the most general way.

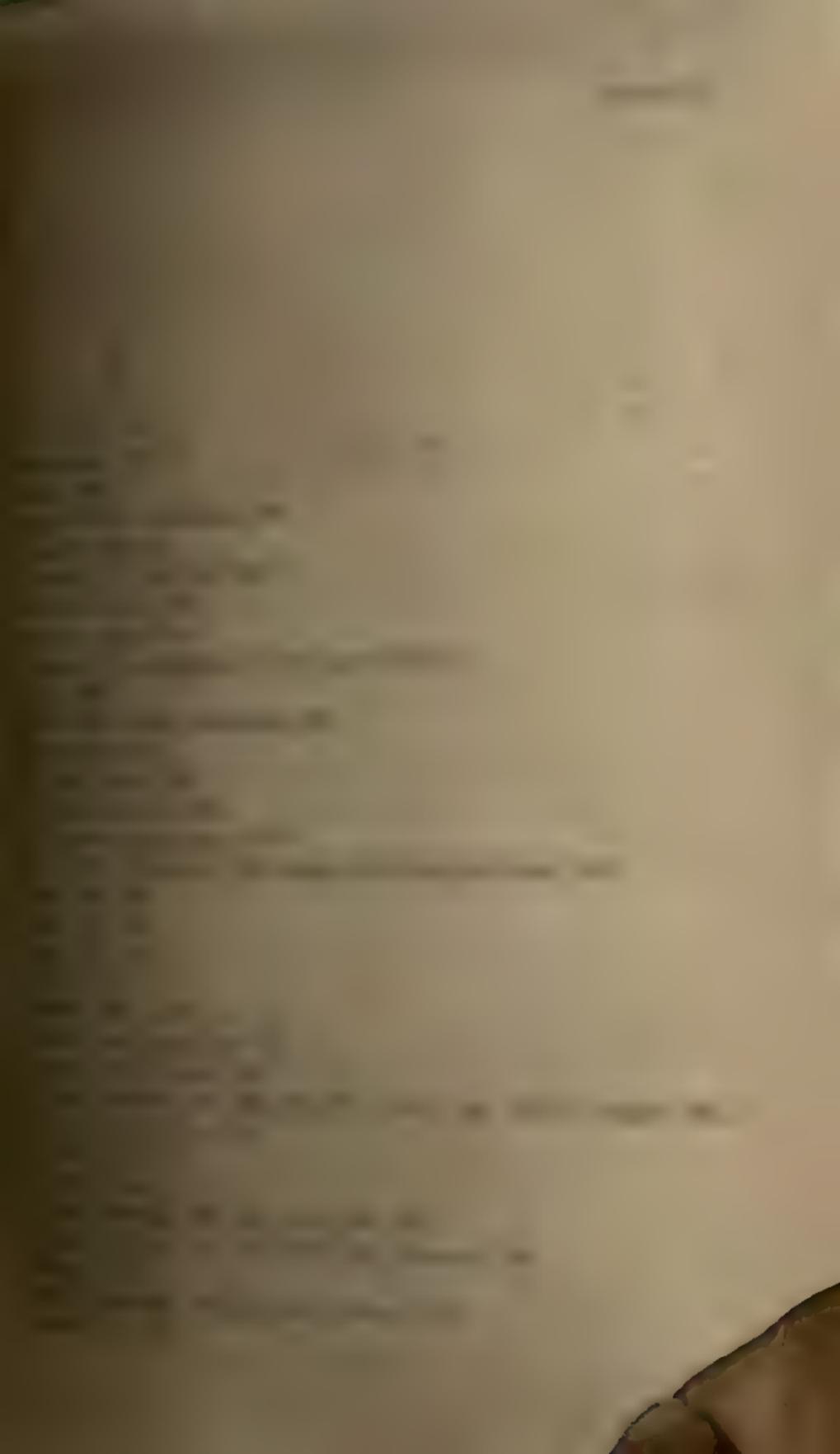
Trying to make as much sense and as little mystery as our knowledge will allow does not mean parading all the knowledge. It means choosing this and that, trying quite deliberately to create for the reader's view an impression which, while it cannot be exact, is not an untruth. I deal with the importance of classical cultures in Melanesia and parts of Malaysia. I contrast them with the complicated Australian kinship systems. If I neglect to mention help systems almost as awesome are indeed found also in parts of Melanesia, and suggested even in Southeast Asia, it is not to let my picture not from being damaged but from being worse, which is sometimes worse. The exceptions, the irregularities, the inconsistencies are endless, and they are necessary to a study of culture and the study of it. Of course to ignore the exceptions entirely would be intolerable in professional writing, but to leave out the fruits of all the work out of the profession is to do the hands of a public which is kind enough to want to know what the anthropologists have been doing, digestive instead of condensation-call it "processing" if you like, the damageability which cannot be avoided.

THE CLOTHESLINE

It was a dark, stormy night. The wind howled like a wild animal, and the rain beat against the windowpanes. In the distance, lightning flashed and thunder roared. A small, shabby house stood alone on a hillside, its windows glowing with a faint light. On the clothesline in front of the house, several pieces of laundry were hanging to dry. A single candle flickered inside the house, casting long shadows across the room. The air was thick with the scent of rain and earth.

A man, dressed in a simple coat and hat, stood outside the house, looking up at the sky. He had a weary expression on his face. He took a deep breath and then stepped forward, reaching out to touch the clothesline. The laundry swayed slightly in the wind. The man's hand moved slowly along the line, touching each piece of clothing. He seemed to be searching for something, but it was clear that he was lost in thought.

The rain continued to fall, and the wind grew stronger. The man remained outside, his hand still resting on the clothesline. He closed his eyes and took a deep breath, as if trying to catch a familiar scent. Finally, he opened his eyes and looked around him. The house was still there, the laundry still hanging on the line. But something had changed. The man's expression was no longer weary; it was filled with a sense of peace and contentment. He turned and walked away from the house, his steps steady and purposeful. The rain continued to fall, but the world seemed brighter and more hopeful.



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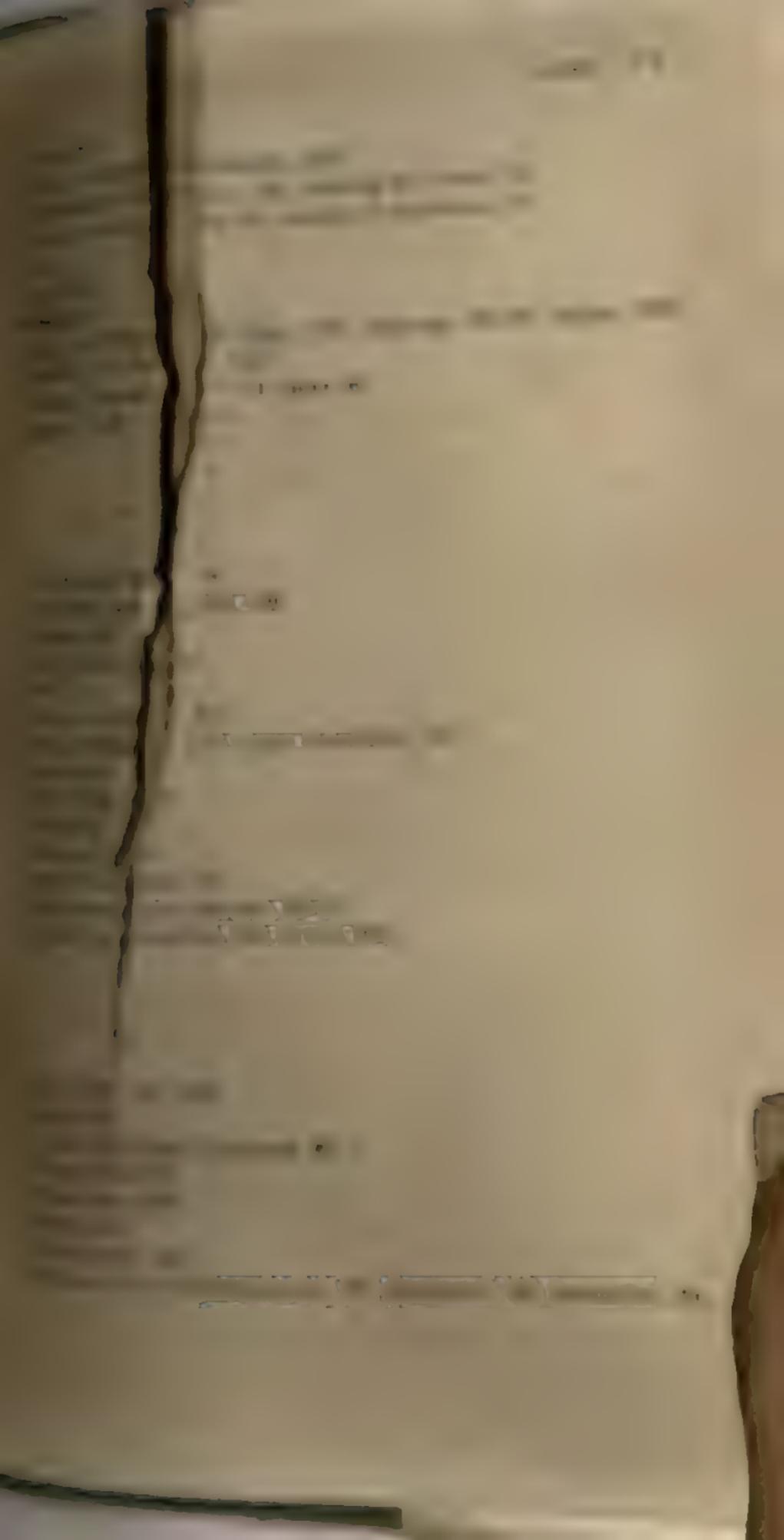
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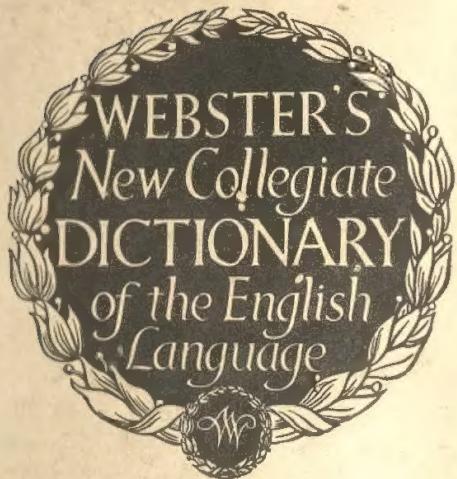
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